

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES 1 6
2. AMENDMENT/MODIFICATION NO. 2	3. EFFECTIVE DATE 10/16/2009	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)	
6. ISSUED BY Procurement Office George C. Marshall Space Flight Center National Aeronautics and Space Administration Marshall Space Flight Center, AL 35812	CODE PS32-B	7. ADMINISTERED BY (If other than Item 6) John Busbey/256.544.0896 FAX 256.544.9162 Email: john.a.busbey@nasa.gov	CODE PS32-B	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State, and Zip Code)			AUTOMATED INVOICE PAYMENT INFORMATION: (256) 544-5566	
			(x)	9A. AMENDMENT OF SOLICITATION NO. NNM09ZPS004E
			X	9B. DATED (SEE ITEM 11) 09/22/2009
				10A. MODIFICATION OF CONTRACT/ORDER NO.
				10B. DATED (SEE ITEM 13)
CODE	FACILITY CODE			

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☒ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☒ is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

- (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(x)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, ☒ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this amendment is to answer questions concerning the above list solicitation. All terms and conditions of the solicitation remain the same.

The bid date, time and location remain the same. The bids to be opened: October 22, 2009 at 1:00 p.m. local time at the Huntsville Madison County Chamber of Commerce, located at 225 Church ST, Huntsville, AL 35810.

Amendment 1, Block 9A of SF30 is corrected to read: NNM09ZPS004E.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.	
15A. NAME AND TITLE OF SIGNER (Type or print)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) John Busbey
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED
16B. UNITED STATES OF AMERICA BY (Signature of Contracting Officer)	16C. DATE SIGNED 10/09/2009

Response to Questions

for

Solicitation NNM09ZPS004E

MSFC 4707 - MPTA Facility Modification for Vertical Weld

Amendment 2

Q1. Please confirm the steel scrim vinyl curtains along the North and South walls will be segmented and fitted to miss the movable platform rollers @ guide columns.

A1. The curtain is located along column line 4 and runs north and south (several feet west of the movable platforms. The movable platform guide rails are located well to the east of the curtain and are located along column lines B and E. There are no curtains along column lines B and E. Refer to drawing A1 general arrangement plan. There should be no interference between the movable platforms and the curtain.

Q.2 Please confirm the two horizontal chilled water pipes (can be seen in Photo #5 on sheet FAC IW 4787-A1 and on sheet FAC IW 4787 – M2, detail 13) will be removed or rerouted to allow travel of movable platform.

A.2 The lines are not being relocated. This movable platform will not be able to travel to the floor.

Q.3. Please confirm travel of movable platform is from floor elevation (+602') to 10th level only.

A.3. The travel distance of the movable platforms is approximately 119'-0" above finish floor. This will match the original upper limit of travel. The platforms will not be able to travel all the way down to the floor due to utilities that have been added over the years. It will also be limited to only travel down to a height that is safely above the tooling platform once it is installed. Hard stops will be installed by the contractor to ensure this lower limit.

Q.4. Please confirm number of automatic stops required and at what levels.

A.4. Response: The elevator will have a stop at each level between 0 and +88'-10 3/4" above finish floor. This is to the 10th level. The platform will travel and have the ability to be stopped at any point between its lowest limit and the 119'-0" level. The elevator will have a floor selection button that will be named "platform". Selecting this level will take the elevator to any point up to the 119'-0" level that the platform is currently stopped at.

Q.5. Please confirm that the overhead crane in the building will be available for use during construction.

A.5. Per MWI 3410.1 Personnel Certification Program, the contractor may obtain a temporary certification to operate MSFC equipment. There are specific requirements in the MWI that they will have to provide. (MWI 3410.1 is attached)

MWI 3410.1

REVISION I

EFFECTIVE DATE: October 1, 2008

EXPIRATION DATE: October 1, 2013

MARSHALL WORK INSTRUCTION

QD01

PERSONNEL CERTIFICATION PROGRAM

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		5/14/99	Document converted from MSFC-P18.1-C01 to a Directive. Previous history retained in system as part of canceled or superseded ISO Document files.
Revision	A	8/16/99	Changed scope to limit personnel certification to work on flight or flight-associated hardware. Added requirement for disposition of records after retention period. Updated for changes due to reorganization. Clarified in paragraphs 1 and 2 that hazardous operations that do not already require certification must be evaluated by S&MA to determine if personnel certification is required.
Revision	B	11/15/99	Complete rewrite to combine safety and skills certification requirements into one instruction.
Revision	C	9/15/00	Modified paragraph 1 to clarify that the document only applies to certifications issued by MSFC. Added documents referenced in Table 1 to applicable documents list. Updated Table 1 to correct requirement errors. Added definitions for Type A and B on-the-job training (OJT). Modified Table 1 to include the appropriate type of OJT. Deleted PCH lifting operations from Table 1 since these are covered by the lifting equipment certification. Changed certification periods of numerous certifications to match OSHA requirement of three years. Added "Propellant and Explosive Inspection" to Table 1. Deleted Note 3 from Table 1. Added paragraph 6.1.2 to require notification of certification expiration 6 months in advance per MPG 3410.1 (NCRs 311 and 312). Added paragraph 6.1.4 to include certified personnel responsibilities. Included the applicable contents of MWI 3410.2 and 3410.3 in Appendices A and B. Added definitions, applicable documents, and applicable quality records from these MWIs. Modified paragraphs 6.3.2 and 6.4 to remove unnecessary requirements. CERTRAK made accessible to employees eliminating the need for certification cards. Deleted Figures 1 and 2 and included necessary requirements in paragraph 6. Added Level III experience requirements to Appendix A and modified requirement for ASNT Level III as a prerequisite for MSFC Level III. Deleted requirement from B2.1 for examiner to document training organization approval process in an organizational issuance.
Revision	D	7/02/01	Changed "Applicability" paragraph to allow issuance of MSFC skills certifications to S&MA mission services contractor personnel. Added the instructions for accessing CERTRAK in the definition of CERTRAK. Modified paragraph 5.11.1 to clarify documentation for OJT Type A. Deleted last sentence in this paragraph. Modified paragraph 5.11.1 to delete reference to MSFC Form 4083-3 and substitute MSFC Form 4333. Modified paragraph 5.11.1 by deleting colon and adding commas. Added CERTRAK to paragraph 6.1.2 and deleted "through the CA," to clarify the means by which personnel and supervisors are notified when certifications are expiring. Moved paragraph 6.5 to paragraph 7. Item number 9.3, added the MSFC Form numbers 4083 and 4083-1. Deleted 9.6 and renumbered paragraphs. To the Lockout/Tagout specialty we added procedure review records. Deleted second reference to cancelled directive MWI 3410.2A dated August 3, 1999. Section 12, add MWI 3410.1C dated September 15, 2000. Modified certification specialties for: Flagman changes requirements; Changed Laser Operator to > Class 3B; Modified Lifting Equipment Examiner (Proficiency Test Examiner); Modified PCH S&MA Monitor to delete organization code. Added asterisks to certification specialties Propellant and Explosive Inspection and Propellant and Explosive User, also modified the certification period for these categories to 1 year; added new safety certifications for

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			Inert/Asphyxiate Gases and Liquids, Hydrogen Handlers, Oxygen Handlers, and Oxygen Users. Modified note (1) to add date of training must be listed on MSFC Form 4083. Modified note number (3) to state that Lockout/Tagout procedures must be reviewed according to 29 CFR 1910.147. Updated NASA-STD references in the titles of MSFC-STDs listed in the applicable documents. Changed Thermography Testing to Thermal/Infrared Testing and clarified requirement. Clarified the certification requirements for NDE Level III in the definitions and in Appendix A. Combined certification requirements for plated-through hole and surface mount technology soldering in Table B-1.
Revision	E	11/8/2004	<p>Revised per HQ Rules Review.</p> <p>Pg. 4, Para. 2. APPLICABILITY, replace will typically be certified with shall be certified. Replace However, all contractors with Additionally, all contractors. Pg. 6, 5.3 CERTRAK, data base is revised to read one word database Pg. 6, Para. 5.3 CERTRAK, add Civil Service and Contractor...employee certification records.</p> <p>Pg. 6, Para. 5.4, Contractor Certifying Officer, replace issue safety certifications with approve...Pg. 6, Para. 5.5 Employee and Organizational Development Department (EODD) add provides personnel certification education and training to civil service and contractor personnel. Pg. 7, Para. 5.11, OJT Training, delete certified operator who supervised operator for 3 months, and add supervisor..., delete signature of, .should read signature of supervisor and applicant. Pg. 8, change to read not to exceed 12 months. Pg. 9, Para. add 6.1.3.1, Ensure that training assessments are completed for all personnel certification specialties. Renumber paras. 6.1.3.2-6.1.3.4, Pg. Pg. 12, change to read or in a location nearby the operation for which the certification is necessary. Pg. 10, Para. 6.2.1, Safety Certification, delete and certification programs. Also delete obtain formal training, OJT, physical examinations, and written and proficiency examinations as required by Table 1. and add comply with Table 1 certification requirements. Pg. 10, Para. 6.3 Contractor Requirements, delete the, training, to read determine the safety and certification training required. Also delete the to read...define other specialties/operations. Pg. 10, Para. 6.3, Contractor Requirements, delete Contractor programs must satisfy the intent and requirements of this Instruction. Pg. 10, Para. 6.3.2, change to .affected employees have training assessments and certifications. Delete receive safety training and certification. Delete issue company certifications or, Pg. 17, Delete OSHA 501 from PCH-S&MA Monitor certification specialty. Delete high school graduate requirement for Propellants and Explosives Inspection cert specialty. Revise the cert period for Propellant and Explosive Handler, and Inspection to 2 years. Para. 6.1.4 was revised to Certified personnel, safety representatives, and supervisors who have been granted approval by the CA. CERTRAK. Pg. 14, Lull Boom was added to Forklift class 7 and deleted as a separate certification specialty. NSS GO 1740.9 deleted throughout the document to be replaced with current document NASA-STD-8719.9, Standard for Lifting Devices and Equipment. Pg. 11, note 7.3 added. Pg. 13, Aerial Lift specialty, proficiency test added to recert column. Derrick Crane Operator cert specialty requirements revised to add PCH/Critical. Derrick Crane specialty, bullet added stating PCH Training for PCH Cert. Derrick Crane recert column delete, or documentation...Pg. 13 Forklift Operator cert specialty, revise bullet to add PCH/Critical. Add bullet to add PCH Training for PCH Cert. (AD42) (See Note 1) Pg. 13, Gantry crane specialty, revise bullet to read Type A OJT for PCH/Critical, also add bullet stating PCH Training for PCH Cert. (AD42) (See Note 1), in recert-requirement column delete or documentation of participation...Pg. 12, changed to read Pg. 13, Hydraset Operator specialty, revise to read Type A OJT for PCH/Critical, also add bullet stating PCH Training for PCH Cert. (AD42) (See Note 1), Pg. 18, Mobile Crane cert specialty revise statement to read Type A OJT for PCH/Critical, add bullet stating</p>

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			<p>PCH Training for PCH Cert. (AD42) (See Note 1) Pg. 19 Overhead crane/hoist operator cert specialty, revise requirement bullet to read Type A OJT for PCH/Critical, add a bullet stating PCH Training for PCH Cert. (AD42) (See Note 1). Revise bullet in recert-requirement column to delete or documentation of participation in two noncritical or critical lift operations per year. Pg. 19, Rigger cert specialty, revise first bullet in requirements column to read Accredited Lift Riggers Course, revise 3rd bullet in requirements column to read Type A OJT for PCH/Critical, add a bullet stating PCH Training for PCH cert. (AD42) (See Note 1). In recert/requirements column delete the words...or documentation in two noncritical or critical lift operations per year. Add a bullet, Written Test. Page 20, delete paragraph 5 and 6. Page 4, delete 3.4 MPD 1280.1, "Marshall Management Manual" directive has been cancelled. Pg. 15. Forklift operator must be 18 years old to operate. Written tests have been deleted in Table 1 as requirements. Written tests will be issued in training specific to the certification and administered by instructor if deemed necessary. QS01 was changed throughout document to QD01 due to S&MA Office designated as a Directorate instead of an Office. Changes throughout document per HQ rules review, changed format.</p>
Revision	F	11/02/2005	<p>Major rewrite to clarify certification flow and requirements. The rewrite affected all sections and section numbering. In Appendix A, AD02 and AD42, organization codes were changed to AS60 and AS42 respectively. Certification tables were changed to appendices. Table 1 is now listed as Appendix A. Several certification specialties were deleted from Appendix A. Those specialties deleted were Asbestos Abatement for asbestos/heavy metal, Asbestos Exposure Awareness (Class IV), Asbestos Operations and Maintenance Class III, Commercial Motor Vehicle Operator (>25,000 lbs), Fall Protection, Flagman, Flight Deck Crew, Hazardous Material Handlers (HAZWOPER), Hyperbaric Chamber, Laser Operator >3A, Mobile Sweeper Operator, PCH Move Manager, PCH Truck Driver (>25,000 lbs), Powder Actuated Tool Operator, Propellant and Explosive Inspection, Rescue Personnel, Scaffolds Competent Person, Space Station Element Transportation System (SSETS) ECS Technician, SSETS INCS Technician, and Wind Tunnel Operator. Hazardous Waste Operations and Emergency Response Technician was added to Appendix A. Appendix B was added for specialties that require state and federal training but MSFC certification is not required. These specialties are Asbestos Abatement for asbestos/heavy metal, Asbestos Exposure Awareness, Asbestos Operations and Maintenance, Commercial Motor Vehicle Operator, and Flight Deck Crew. Available Safety, Health, and Environmental (SHE) equivalent numbers were added to NSTC course numbers. Updated "PURPOSE" by adding the following sentence: "For personnel training/qualification which does not require certification, reference MPR 3410.1, Training."; Updated the "APPLICABILITY" section by revising the first sentence as follows: deleted "at MSFC engaged in" added "performing", deleted Table 1 added Appendix A, deleted S&MA added Safety and Mission Assurance Directorate (S&MA), deleted "critical", deleted Table 2, added Appendix C, revised sentence to read "for flight and flight-associated hardware.", and deleted ", or other hardware as identified by the process owner"; In second sentence deleted "that MSFC Safety and Mission Assurance (S&MA) reviews and approves."; In third sentence added "to include university and grant personnel" deleted "or" added "and"; Updated the "APPLICABLE DOCUMENTS" section by performing the following: 1) Deleted MSFC-SPEC-445, "Adhesive Bonding, Process, and Inspection Requirements" because there are no certification training courses or certified instructors available for this process., 2) Deleted MSFC-STD-2907, "Workmanship Standard for Printed Wiring Boards" because this document applies to the manufacture of printed wiring board products and not to electrical process skills</p>

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		<p>(EPS)., 3) Added NAS 410, "National Aerospace Standard (NAS) Certification and Qualification of Nondestructive Test Personnel" because this is the actual standard that applies to the training requirements for MSFC Level I and Level II personnel., added NPR 1441.1 "NASA Record Retention Schedule (NPRS)" and 4) Renumbered the paragraphs in the "APPLICABLE DOCUMENTS" section; Updated the "DEFINITIONS" section by performing the following: 1) Revised paragraphs 5.1, 5.3, 5.4, 5.5, 5.6 5.7, 5.9, 5.10, 5.11, 5.11.1, 5.11.2, 5.12, 5.13, 5.14, 5.15, 5.16, 5.21, 5.22, 5.23., 2) Added the definition for "Technical Advisor", and 3) Renumbered the paragraphs in the "DEFINITIONS" section; Updated the "INSTRUCTIONS" section by revising paragraphs 6.1.1, 6.1.2, 6.1.3.1, 6.1.3.2, 6.1.3.3, 6.1.3.4, 6.1.3.5, 6.1.3.6, 6.1.4, 6.2.1, 6.2.2, 6.3, 6.3.1, 6.3.3, 6.3.4, 6.3.5; Deleted all notes in Section 7 and replaced with "None;" Updated the "RECORDS" section by revising paragraphs 9. RECORDS, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8; Revised 12. CANCELLATION to cancel previous MWI 3410.1 version and effective date. Added Lockout/Tagout note for Appendix A. Added Appendix B, added NOTES FOR APPENDIX B; Deleted NOTES FOR APPENDIX A (1), (2), (3), (4); Updated "Appendix C" by deleting the following test methods, document, and processes: "Acoustic Emissions Testing", "Thermal/Infrared Testing", "Computed Tomography", "Adhesive Bonding Application", "MSFC-STD-445", and "Wire Wrap". There are no certification training courses or certified instructors available for the test methods, per the document requirements, or for the two processes listed above; Also, updated the "REQUIREMENTS" column of APPENDIX C; Updated "APPENDIX D" section D.1 titled "PURPOSE" by replacing "NDT" with "Nondestructive Testing/Nondestructive Evaluation (NDT/NDE)", and by deleting items f, g, and h for "Acoustic Emissions Testing (AE)", "Thermal/Infrared Testing (TIR)", and "Computed Thermography (CT)", respectively; Revised paragraph D1.1 titled "Exceptions" by deleting the last sentence; Revised paragraphs D1.2 and D1.3; Updated section D.2 titled "TRAINING AND EXPERIENCE REQUIREMENTS" by performing the following: 1) Added the following after the first sentence: "All NDT training shall comply with the requirements of NAS 410, NAS Certification and Qualification of Nondestructive Test Personnel, except as noted herein.", 2) Deleted "1996" from "SNT-TC-1A", 3) Deleted paragraph A.2.1 titled "Specialist Personnel" in its entirety, 4) Revised paragraphs D.2.2, D.2.4, D.2.5, D.2.6, and D.2.6.1a, and 5) Renumbered all paragraphs in section D.2; Replaced "Table A-1" with "Table D-1" and updated "APPENDIX D-1" by performing the following: 1) Deleted all entries for Examination Methods "AE", "CT", "TIR", 2) Deleted Notes 1-3 of TABLE D-1; Update section D.3 titled "CERTIFICATION" by revising paragraphs D.3.2 and D.3.3; Updated "APPENDIX E" section E.1 titled "PURPOSE" by deleting the following sentence: "These requirements also apply when other program/industry documents are used that require personnel certification."; Updated paragraph E.1.2.1 by replacing "Table B-1" with "Appendix E-1"; Updated paragraph E.1.2.2 by replacing "examiners" with "technical advisors"; Revised paragraph E.2.1 titled "Training Organization" as follows: "Training shall be obtained from a school approved by a technical advisor and the MSFC Certifying Officer. Other agencies, which may be used for training, shall be subject to review and approval by the technical advisor and MSFC Certifying Officer."; Updated paragraph E.2.2 titled "Lesson Plans" by replacing "examiner" with "technical advisor"; Revised paragraph E.2.3 titled "Instructor Qualifications" as follows: "Instructors shall be recognized experts in their field. Instructors shall be evaluated to requirements of the EPS documents specified herein, as determined by the MSFC Certifying Officer and technical advisor."; Updated paragraph E.2.4.1 by performing the following: 1) Replace "Table B-1" with "Appendix E-1", 2) Replace "examiner" with "technical advisor", 3)</p>
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			<p>Replace "Certifying Officer" with "MSFC Certifying Officer", and 4)</p> <p>Delete the words "except printed wiring board, (PWB) inspection" from the last sentence of the paragraph; Add the following after the last sentence of the paragraph "Also, for surface mount technology (MSFC-STD-2904), operator certification shall require additional training on the exact machine used for production at the supervisor's discretion.";</p> <p>Updated paragraph E.2.4.2 titled "Examinations" by replacing "examiner" with "instructor", and by deleting the last sentence of the paragraph; Updated paragraph E.2.4.2b titled "Written Examination" by deleting the last sentence of the paragraph; and revising as follows: "For initial certification, each candidate shall score at least 80 percent on a written exam typically consisting of at least 25 questions."; Updated paragraph E.2.4.2c titled "Practical Examination" by deleting the words "and PWB inspection" from the first sentence of the paragraph, and revising the last sentence of the paragraph as follows: "As an option to the practical exam, proficiency demonstration can also be accomplished by a supervisor and MSFC Certifying Officer audit of actual work performed provided the audit results are documented and included in the employee's personnel certification file."; Updated paragraph E.3.1 by revising the first sentence as follows: "Candidate civil service personnel who meet the above criteria shall be certified by the MSFC Certifying Officer upon the recommendations of their supervisors. Contractor personnel shall..."; Updated "TABLE E-1" by deleting all entries for "Wire wrap" and "PWB Inspection", and by deleting Note 1 and Note 5 and all superscripts. Also, updated the "RECERT" column of TABLE E-1 by adding "See E3.2.b" for ESD control; Revised paragraph E.3.2 titled "Recertification" as follows: "Training for recertification shall be required at the discretion of individual's supervisor. Recertification shall include a demonstration of proficiency in accordance with E.3.2.1.", a. "Recertification of electrical process skills (EPS) operators and inspectors shall be required every 3 years except for ESD.", b. "ESD recertification shall be required at the discretion of the individual's supervisor based on personnel performance, the use of new technology, or when requirement violations are observed.", c. "When necessary, the MSFC Certifying Officer shall extend or limit the certification period based on recommendations of the individual's supervisor. Extensions may not exceed 6 months.", d. "EPS proficiency examiners/instructors shall be recertified every 2 years except for ESD."; Revised paragraph E.3.2.1 as follows: "Demonstration of proficiency shall be required for recertification. This may be achieved by fabrication/inspection of samples, completion of a refresher training course approved by the technical advisor, or by auditing an individual's actual work performed by the MSFC Certifying Officer and their supervisor. Recertification may also include a written examination." Updated paragraph E.3.2.2 by revising the last sentence as follows: "The method chosen for recertification shall be the responsibility of the individual's supervisor." Deleted paragraph B.3.2.3 in its entirety; Updated paragraph E.3.3.5 by revising as follows: "Job function has changed and new function does not require EPS."</p>
Revision	G	11/02/2006	<p>Complete rewrite to better define the certification process and place one "shall" per paragraph; Added the word "Test" to the document title in paragraph 3.20; On page 24, changed "Skill" to "Skills" for Appendix C; In paragraph D.1.1 titled "Exceptions", changed "electro-mechanical" to "electromechanical". Changed "may" to "can" in paragraph D.2.2.3 (e); Changed "may" to "can" in the second and last sentences of paragraph D.2.6; Revised the second sentence of paragraph E.2.1 as follows: "Other agencies used for training shall be subject to review and approval by the technical advisor and the MSFC Certifying Officer."; Changed "may" to "can" in the third sentence of paragraph E.2.4.2 (c); Changed "may" to "shall" in the last sentence of paragraph E3.2 (c); Changed "may" to "can" in the second and last sentences of paragraph E3.2.1; Deleted an extra "space" in paragraph E3.3.5. Acronym listed added.</p>

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			Section 6.6 revised. Section 6.1.1.3 & 4 deleted. Applicable Document MPR 1800.1, "MSFC Occupational Medicine". 5.11 Training deleted. 6.3.2 and 6.3.8 revised for clarity. 6.3.3.2 and 6.3.7 is revised for clarity. NOTES A.2 added to clarify physical exam not necessary for systems designers who do not have hands-on experience with systems as applicable. A.3 added to clarify certification process when a medical exam is failed. Lockout/Tagout and Radiation physical requirements were deleted. Incident Commander added to HAZWOPER certification specialty.
Revision	H	10/10/2007	Document updated for clarity. Updated the "Purpose" statement, Applicability, and Applicable Documents sections by replacing the MSFC Standards with the associated NASA Standards. Revised the "Acronyms and Definitions" section by adding (CEUs) Continuing Education Units, (CO) Contracting Officer, (ET) Eddy Current Testing, (MT) Magnetic Particle Testing, (NASA) National Aeronautics and Space Administration, (PT) Penetrant Testing, (RT) Radiographic Testing, (SMT) Surface Mount Technology, (UT) Ultrasonic Testing, and renumbered paragraphs. Revised paragraphs 5.2.25, 6.1.5.3, 6.1.6.2, 6.2.1, 6.2.5.1, 6.3.4.1, 6.3.9, 6.3.11, 6.6.1, and 6.7.1.1. Added new paragraph 6.7.3. Changed department title of organization from "SR&QA Policy and Assessment" to "Mission Systems Assurance and Technical Support" in paragraphs 6.1.2.1, 6.1.6.13, 6.1.6.14, and D.4.3.3. Changed the title of Appendix D. Revised Appendices A, and B. Updated Table C-1, and Appendix D in entirety. Appendix E reformatted and paragraphs renumbered. Revised Appendix E in entirety by replacing "certifying officer and MSFC Certifying Officer" with "S&MA Certifying Officer," and in Table E-1 replaced the MSFC Standards with the associated NASA Standards. Revised paragraph E.2.4.4 by replacing MSFC-STD-2904 with NASA-STD-8739.2. Revised paragraph E.2.5.3.2 by adding the phrase "or an equivalent visual acuity record." [Administrative change made on 10/29/07 by Directives Manager at request of OPRD updating time periods in Appendix A, Table A-1, page 27 for Hydrogen System Operator from 3 years to 4 years and page 28 for Liquid Nitrogen System Operator from 2 years to 4 years.]
Revision	I	10/1/2008	Revised 2. Applicability statement to address the applicability of this directive to the Michoud Assembly Facility. Moved Contractor section to 6.1.9 to be under 6.1 Responsibilities. Added additional information in 6.2 to better define actual certification process. Added section 6.11 to identify MAF responsibilities and also throughout MWI where applicable. Reworded some existing statements to include MAF and to be clearer in their meaning. Changed Appendices to Chapters and added Chapters F and G. Revised Acronyms and Definitions, and Records sections. Revised paragraph numbering and tables in Chapters 4 and 5 (originally Appendices D and E, respectively) to comply with new format for document. Added titles of MSFC forms. Revised document to remove references to the NASA MAF Safety Office and the NASA MAF Environmental Office. Added Table of Contents. [On 2/5/09, at the request of the OPRD, an administrative change was made to Table CH1-1 from (SMA-SAFE-NSTC-0315) to (SMA-SAFE-NSTC-0317).]

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P1. PURPOSE

The purpose of this Marshall Work Instruction (MWI) is to establish the Marshall Space Flight Center (MSFC) Personnel Certification Program. It describes the process and contains the requirements for safety and skills certifications issued by MSFC. For personnel training/qualification which does not require certifications, reference Marshall Procedural Requirements (MPR) 3410.1, "Training."

P2. APPLICABILITY

2.1 This MWI applies to the personnel, programs, projects, and activities at Marshall Space Flight Center (MSFC) and MSFC's Michoud Assembly Facility (MAF), including contractors and resident agencies to the extent specified in their respective contracts or agreements. ("Contractors," for purposes of this paragraph, include contractors, grantees, Cooperative Agreement recipients, Space Act Agreement partners, or other agreement parties.)

2.2 This MWI applies to all MSFC civil service and contractor personnel performing the potentially-hazardous operations identified in Chapters 1, 2, 6 and 7, and to MSFC civil service personnel and MSFC Safety and Mission Assurance Directorate (S&MA) mission services contractor personnel who perform skills identified in Chapter 3, 4, and 5 for flight and flight-associated hardware.

2.3 Lockheed Martin External Tank employees are excluded from the requirements of this MWI to the extent specified in their contract.

P3. APPLICABLE DOCUMENTS

3.1 29 CFR Part 1910, "Occupational Safety and Health Standards"

3.2 29 CFR Part 1926, "Safety and Health Regulations for Construction"

3.3 29 CFR Part 1960, "Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters"

3.4 NPR 1441.1, "NASA Record Retention Schedules (NRRS)"

3.5 NPR 8715.3, "NASA General Safety Program Requirements"

3.6 MPD 1840.3, "MSFC Respiratory Protection Program"

3.7 MPD 1860.1, "Laser Safety"

3.8 MPD 1860.2, "Radiation Safety Program"

3.9 MPR 1810.1, "MSFC Occupational Medicine"

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- 3.10 MPR 1840.1, "MSFC Confined Space Entries"
- 3.11 MPR 3410.1, "Training"
- 3.12 MWI 6410.1, "Packaging, Handling, and Moving Program Critical Hardware"
- 3.13 MWI 6430.1, "Lifting Equipment and Operations"
- 3.14 MWI 8715.2, "Lockout/Tagout Program"
- 3.15 MWI 8715.10, "Explosives, Propellants, and Pyrotechnics Program"
- 3.16 MSFC-RQMT-2918, "Requirements for Electrostatic Discharge Control"
- 3.17 NAS 410, "National Aerospace Standard (NAS) Certification and Qualification of Nondestructive Test Personnel"
- 3.18 NASA-STD-8719.9, "Standard for Lifting Devices and Equipment"
- 3.19 NASA-STD-8739.1, "Workmanship Standard for Polymeric Application on Electronic Assemblies"
- 3.20 NASA-STD-8739.2, "Workmanship Standard for Surface Mount Technology"
- 3.21 NASA-STD-8739.3, "Soldered Electrical Connections"
- 3.22 NASA-STD-8739.4, "Crimping, Interconnecting Cables, Harnesses, and Wiring"
- 3.23 NSS 1740.12, "Safety Standards for Explosives, Propellants, and Pyrotechnics"
- 3.24 ANSI Z136.1, "Safe Use of Lasers"
- 3.25 SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing"

P4. REFERENCES

- 4.1 MPR 8715.1, "Marshall Safety, Health, and Environmental (SHE) Program"

P5. ACRONYMS and DEFINITIONS

5.1 Acronyms

- 5.1.1 (ASNT) American Society for Nondestructive Testing
- 5.1.2 (CA) Certification Administrator

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- 5.1.3 (CDL) Commercial Drivers License
- 5.1.4 (CERTRAK) Certification Tracking
- 5.1.5 (CEUs) Continuing Education Units
- 5.1.6 (CO) Contracting Officer
- 5.1.7 (DOT) Department of Transportation
- 5.1.8 (EEOH) Environmental Engineering and Occupational Health Office
- 5.1.9 (EN) European
- 5.1.10 (EPS) Electrical Process Skills
- 5.1.11 (ESD) Electrostatic Discharge
- 5.1.12 (ET) Eddy Current Testing
- 5.1.13 (FAR) Federal Acquisition Regulation
- 5.1.14 (FMO) Facilities Management Office
- 5.1.15 (HAZWOPER) Hazardous Waste Operations
- 5.1.16 (ISB) Industrial Safety Branch
- 5.1.17 (ISO) International Standards Organization
- 5.1.18 (LSO) Logistics Services Office
- 5.1.19 (MI&O) MAF Integration and Operations
- 5.1.20 (MT) Magnetic Particle Testing
- 5.1.21 (NAS) National Aerospace Standard
- 5.1.22 (NASA) National Aeronautics and Space Administration
- 5.1.23 (NFS) NASA FAR Supplement
- 5.1.24 (NDE) Nondestructive Evaluation
- 5.1.25 (NDT) Nondestructive Testing

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5.1.26 (NRRS) NASA Records Retention Schedule

5.1.27 (NSS) NASA Safety Standards

5.1.28 (NSTC) NASA Safety Training Center

5.1.29 (OJT) On-the-Job Training

5.1.30 (OMEHS) Occupational Medicine and Environmental Health Services

5.1.31 (OSHA) Occupational Safety and Health Administration

5.1.32 (PCH) Program Critical Hardware

5.1.33 (PT) Penetrant Testing

5.1.34 (RT) Radiographic Testing

5.1.35 (S&MA) Safety and Mission Assurance Directorate

5.1.36 (SSWP) Supervisor Safety Web Page

5.1.37 (SCBA) Self-Contained Breathing Apparatus

5.1.38 (SHE) Safety, Health, and Environmental

5.1.39 (SMT) Surface Mount Technology

5.1.40 (UT) Ultrasonic Testing

5.1.41 (VAB) Vehicle Assembly Building

5.2 Definitions

5.2.1 ASNT NDE Level III Certificate. This certificate is a confirmation of qualification and is issued by the American Society of Nondestructive Testing. It indicates that a person has passed the general, specific, and practical examinations in accordance with Recommended Practice SNT-TC-1A. Issuance of this certification is the responsibility of the employer.

5.2.2 CERTRAK Administrator (CA). The person designated the administrative functions of safety and skill training/certification.

5.2.3 Certification (Personnel). The act of verifying and documenting that personnel have completed required training, including OJT, medical requirements (if any) and have demonstrated specified proficiency.

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5.2.4 Certifying Officer. The person designated to approve personnel for safety certification specialties/skilled operations, or the person designated by the contractor to approve contractor personnel for safety certification specialties.

5.2.5 CERTRAK. The S&MA software database utilized for employee certification records. CERTRAK is used to access personnel certifications electronically and is accessed via the MSFC SHE Web page.

5.2.6 Closed Book Examinations. An examination administered without access to reference material except that provided with or in the examination.

5.2.7 Cognizant NDT/NDE Organization. The NDE team located at NASA MSFC.

5.2.8 Committee or Panel Meeting. Meetings, conferences, symposia, seminars, trade association meetings, panels, etc., organized or sponsored by a regional, national, or international NDT organization or technical society. Foreign or international meetings qualify, if the sponsor(s) are national or international.

5.2.9 Committee Projects. Specific identifiable official activities of regional or national technical societies, committees, or work groups such as round-robins or individual studies, preparation of guidelines, specifications, recommended practices, procedures, codes or standards. Documentation can include memos or reports, drafts of committee output documents, or official written comments submitted by the candidate on such documents.

5.2.10 CO. A person, appointed in accordance with the Federal Acquisition Regulation (FAR)/NASA FAR Supplement (NFS), with the authority to enter into, administer, change, and/or terminate Government contracts, and make related determinations and findings.

5.2.11 Contractor Certifying Officer. The contractor employee who is authorized by the S&MA Directorate to approve safety and skills certifications.

5.2.12 Employer. A Government, prime contractor, subcontractor, supplier, processor, or outside agency employing individuals performing Electrical Process Skills (EPS), Nondestructive Testing (NDT), or safety operations.

5.2.13 European (EN) 473 Certificate. This certificate is a confirmation of qualification and is issued in accordance with the European Standard *General Principles for Qualification and Certification of NDT Personnel* and indicates successful completion of the requirements of that document. Issuance of this certification is the responsibility of the employer.

5.2.14 Evaluation. A review, following interpretation of the indications noted during an NDT inspection, to determine whether they meet specified acceptance criteria or to determine its significance.

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5.2.15 Examination. Formal, controlled, documented testing conducted in accordance with a documented written practice to verify the candidate's knowledge of applicable NDT methods.

5.2.16 Experience. Work activities accomplished in a specific NDT method under the direction of qualified supervision including the actual performance and use of the equipment in that method. This does not include classroom training, but does include OJT.

5.2.17 General Examination. A written examination addressing the basic principles and theory of the applicable NDT method.

5.2.18 Indication. The response or evidence of a condition resulting from an NDT inspection that requires interpretation to determine its significance.

5.2.19 Interpretation. The determination of whether indications are relevant or nonrelevant.

5.2.20 ISO 9712 Certificate. This certificate is a confirmation of qualification and is issued in accordance to the International Standard *Nondestructive Testing -- Qualification and Certification of Personnel*, and indicates successful completion of the requirements of that document. Issuance of this certification is the responsibility of the employer.

5.2.21 Method. One of the disciplines of nondestructive inspection or testing (e.g., radiography) within which different techniques exist.

5.2.22 OJT. Supervised training by a journeyman employee that is skilled and knowledgeable in the job/task of an apprentice employee while they perform a job/task. Also, per NDE/NDT applications, training in the work environment for learning instrument set-up, equipment operation, recognition of indications, and interpretation under appropriate technical guidance.

5.2.23 OMEHS. The Office that ensures medical certification in health hazards and related activities per NPR 8715.3, NASA General Safety Program Requirements.

5.2.24 Operator. An employee who manually or remotely controls or directs the functioning of a system, process, or operation.

5.2.25 Potentially-Hazardous. Any operation involving material or equipment that has a high potential to result in loss of life, serious injury to personnel, or damage to systems, equipment or facilities.

5.2.26 Practical Examination. The examination used to demonstrate an individual's ability to conduct the NDT method that will be performed for the employer.

5.2.27 Procedure. A general or detailed written instruction for conducting a given process applicable to a specific NDT method.

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5.2.28 Proficiency Examiner. The qualified person(s) designated by the S&MA Directorate to develop and administer exams necessary to achieve the desired proficiency in a safety specialty or skill.

5.2.29 Provisional Certification (applies to safety specialties only). Provisional certifications are issued to candidates who meet all qualifications except OJT. Provisional certifications are issued for up to 1 year. During this year, applicants exercise the tasks requiring safety certification, but only under the direct supervision of a certified operator thereby receiving the necessary OJT (similar to driving a car under the supervision of a licensed driver). Upon completion of OJT, candidates apply for certification by submitting an MSFC Form 4333, "Training Requirements Plan" or equivalent documentation to the S&MA CA.

5.2.30 Qualification. Demonstration of skill and knowledge along with documented training and experience required for personnel to properly perform the duties of a specific job.

5.2.31 Recertification. The process of reconfirming the certification of an individual by training and/or proficiency test at the end of a predetermined period, or when lack of proficiency dictates.

5.2.32 Safety Certification Specialties. Specialties requiring safety certification, as well as, an official record of safety training. Safety certifications are issued to employees who have completed the required training and demonstrated the necessary knowledge and/or proficiency to ensure their ability to complete potentially-hazardous operations in a safe manner.

5.2.33 Safety Training Specialties. Specialties for which authority documents (OSHA, National Fire Protection Association, NASA, etc.) require an official record of safety training, but do not require safety certification.

5.2.34 Skilled Operations. A necessary activity which is critical to the required quality level of a produced article or material.

5.2.35 Specific Examination. The written examination to determine an individual's understanding of operating procedures, codes, standards, product technology, test, techniques, equipment, and specifications for a given NDT method as used by the employer.

5.2.36 Supervisor. The person assigned supervisory functions for employee performing the job or tasks that require training and/or certification (e.g., organizational line manager, foreman, branch chief or team lead).

5.2.37 Technical Advisor. The person(s) recommended by their supervisor for approval by the S&MA Certifying Officer to evaluate EPS requirements for certification. Technical advisors also review consultant training courses to ensure technical adequacy. Technical advisors complete the same training requirements as EPS operators and inspectors, or have equivalent experience. Technical advisors do not need to be certified; however, they are recognized as experts in their field.

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5.2.38 Technique. A category within a method (e.g., ultrasonic immersion testing, ultrasonic contact testing). Specific techniques within a method are defined by the cognizant NDT organization.

5.2.39 Temporary Certification. Temporary certifications are issued to candidates who meet all the qualifications except formal training, and are performing an operation proficiently. Candidates are allowed up to 1 year to complete the required training.

5.2.40 Test Samples. Parts or images containing known discontinuities or defects used in the practical examination to demonstrate the candidate's proficiency in using a particular method. Test samples can refer to images of actual hardware such as radiographs.

5.2.41 Training and Incentives Office. The MSFC organization that provides personnel certification education and training to civil service and contractor personnel.

5.2.42 Training Coordinator. The person(s) in the Training and Incentives Office designated to provide the administrative functions of training, scheduling, procurement, and documentation.

5.2.43 Training Database. The database managed by the Training and Incentives Office where records of employee (civil servant and contractor) training are retained.

5.2.44 Written Instruction. A procedure detailing the NDT technique and testing parameters used for the inspection of a specific component, group of parts (e.g., "aluminum extrusions," "aluminum brackets"), or assembly. These are sometimes referred to as "technique sheets," or "data cards."

5.2.45 Written Practice. A procedure that describes the control and administration of NDT personnel qualification and certification.

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DOCUMENT CONTENT

6. INSTRUCTIONS

6.1 Responsibilities

6.1.1 MSFC S&MA Directorate shall:

6.1.1.1 Identify jobs and tasks that require an MSFC or MSFC's MAF, safety, and skill certification.

6.1.1.2 Implement the personnel certification program and maintain it in CERTRAK.

6.1.1.3 Designate a Certifying Officer for S&MA and MSFC's MAF. The Certifying Officer at MAF is the MSFC S&MA representative located at MSFC's MAF.

6.1.2 S&MA and MSFC's MAF, Certifying Officer or their designee shall:

6.1.2.1 Oversee the MSFC certification program by ensuring appropriate training courses are provided for the certification listed in Chapters 1 through 7.

6.1.2.2 Ensure the content of these training courses are reviewed by MSFC or MSFC's MAF, organization requiring the certification [i.e., ISB, EEOH, or Mission Systems Assurance and Technical Support Department, (if applicable), Facilities Management Office (FMO), Logistics Services Office (LSO)].

6.1.2.3 Coordinate the review and approval of certification packages with the CA and representatives from the ISB, EEOH, or Mission Systems Assurance and Technical Support Department, (if applicable). At MSFC, this coordination is with the S&MA CA.

6.1.2.4 Ensure personnel and/or their supervisors are notified at least 6 months prior to an existing certification expiration date and every month thereafter until the certification has been renewed or moved to the inactive file. Personnel without computer access are notified by their supervisor.

6.1.2.5 Ensure when a certification is required, the MSFC Form 4083, "Personnel Certification" contains the following information: 1) name of operation for which the certification is being obtained; 2) required training with certificates, signatures of instructors, or sign-in sheets; 3) signature of proficiency examiner when required in accordance with Chapter 1 or Chapter 6; 4) signature of employee and organization; 5) signature of supervisor and organization and 6) signature of Contractor Certifying Officer, if applicable.

6.1.2.6 Ensure when a temporary or provisional certification is required, that MSFC Form 4083-1, "Temporary Safety Certification" contains the following: 1) name of operation for which the certification is being obtained; 2) experience needed for the certification; 3) signature of

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proficiency examiner when required in accordance with Chapter 1 or Chapter 6; 4) signature of employee and organization; 5) signature of supervisor and organization and 6) signature of Contractor Certifying Officer, if applicable. For CERTRAK data entry purposes, the date the employee received training, is the date the MSFC Form 4083-1, "Temporary Safety Certification" was signed by the Certifying Officer or their designee. At MSFC, this form is signed by the S&MA Certifying Officer and is signed by the MSFC S&MA representative located at MSFC's MAF.

6.1.2.7 Forward the signed MSFC Form 4083, "Personnel Certification," MSFC Form 4083-2, "Annual Personnel Certification Statement" proficiency test, (if applicable), or for a temporary or provisional certification MSFC Form 4083-1, "Temporary Safety Certification" to the CA for inclusion in CERTRAK. At MSFC, the forms are forwarded to the S&MA CA and at MAF, the forms are forwarded to the MSFC's MAF CA.

6.1.2.8 Return incomplete or inaccurate certification package (MSFC Form 4083, "Personnel Certification," MSFC Form 4083-2, "Annual Personnel Certification Statement" and proficiency test results) to the supervisor.

6.1.2.9 Designate the S&MA CA or MSFC's MAF CA.

6.1.2.10 Ensure Contractor Certifying Officers forward a complete and signed MSFC Form 4083, "Personnel Certification," MSFC 4083-2, "Annual Personnel Certification Statement" and proficiency test to the CA for inclusion in CERTRAK. At MSFC, the forms are forwarded to the S&MA CA and at MAF, the forms are forwarded to the MSFC's MAF CA.

6.1.2.11 Have the authority to approve certification extensions not to exceed 12 months.

6.1.2.12 Be listed in CERTRAK as a Certifying Officer. The listing of all Certifying Officers is reviewed every 3 years by ISB and updated as necessary.

6.1.3 S&MA CA and MSFC's MAF CA shall:

6.1.3.1 Ensure CERTRAK is maintained current with the names of employees who have safety and skills certifications, names of Certifying Officers, and proficiency examiners.

6.1.3.2 Assist the Certifying Officer, representatives from ISB or Mission Systems Assurance and Technical Support Department, MSFC and MSFC's MAF, organizations as needed in reviewing and approving training courses, and certification packages (if appropriate). At MSFC assist the S&MA Certifying Officer and at MSFC's MAF, assist the MAF Certifying Officer.

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6.1.3.3 Act as the Certifying Officer when delegated this function by the Certifying Officer to review and approve MSFC Form 4083, "Personnel Certification," MSFC Form 4083-2, "Annual Personnel Certification Statement" proficiency test, MSFC form 4083-1, "Temporary Safety Certification" for temporary or provisional certifications and enter into CERTRAK. At MSFC, this function can be delegated by the S&MA Certifying Officer.

6.1.4 ISB, EEOH, and Mission Systems Assurance & Technical Support Department Training Coordinators shall:

6.1.4.1 Assist the Certifying Officer and/or CA in reviewing and approving training courses and certification packages (if applicable).

6.1.4.2 Evaluate proficiency examiner training and documentation (if applicable).

6.1.4.3 Coordinate with other organizations (i.e., FMO, LSO, MSFC's MAF organizations) as needed to review and approve training courses.

6.1.5 Proficiency Examiners shall:

6.1.5.1 Present Train-the-Trainer documentation, or equivalent documentation to the ISB training coordinator or Mission Systems Assurance and Technical Support Department training coordinator for approval. At MSFC's MAF, this documentation is presented to the NASA Safety Office or designee for approval.

6.1.5.2 Have Train-the-Trainer experience, certificates of training, and prior work experience before serving in this role.

6.1.5.3 Serve as the instructor when applicable.

6.1.5.4 Be listed in CERTRAK as approved to serve as a proficiency examiner. At MSFC, approval is obtained from S&MA.

6.1.5.5 Provide proficiency testing to MSFC or MSFC's MAF, employees when required in accordance with Chapter 1 and Chapter 6.

6.1.5.6 Have proficiency credentials reviewed by ISB every 3 years.

6.1.6 Supervisors shall:

6.1.6.1 Ensure training need assessments are completed for all personnel in their area of responsibility. These assessments include, but are not limited to, the following:

a. Supervisor SHE Training Assessment located on Supervisor Safety Web Page (SSWP). The SSWP is located on the "Inside Marshall," "Safety, Health and Environmental" Web page pull-down menu "Databases and Links."

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b. Professional Development Assessment, or any other assessment associated with the training needed for the employee to perform their assigned tasks. See MPR 3410.1, "Training" for more information on this type assessment.

6.1.6.2 Identify potentially-hazardous operations/tasks performed by their employees listed in Chapters 1, 2, 6 and 7 that require a safety certification. Contact ISB when unsure if a certification is required.

6.1.6.3 Identify the employees performing these potentially-hazardous operations/tasks and ensure they receive the training needed to receive the required safety certification.

6.1.6.4 Ensure the employees identified to require a certification possess the knowledge, skill, experience, and level of proficiency that will result in safe performance of potentially-hazardous operations encompassed by their job descriptions.

6.1.6.5 Notify the employee of their need for a certification and assist the employee in receiving appropriate training, OJT experience, and medical examination (if applicable).

6.1.6.6 Review employee's training/certification documentation at least yearly, and ensure the proficiency of the employee by monitoring the employee while performing the operation (as applicable).

6.1.6.7 Ensure the employee is up-to-date with current methods, techniques, and lessons-learned associated with the operation/tasks they are performing (if applicable).

6.1.6.8 Ensure employees receive an annual medical exam for certifications (if applicable).

6.1.6.9 Assign qualified personnel as proficiency examiners when requested from ISB or the MSFC's MAF, Safety Office. Proficiency examiners are to be listed in CERTRAK before the certification can be approved).

6.1.6.10 Identify potentially-hazardous operations and skills not currently listed in Chapters 1 through 7 to ISB or for evaluation to determine if personnel certification is necessary.

6.1.6.11 Assist ISB and EEOH, for certifications currently not listed in CERTRAK in the determination of certification requirements, development of training material, and in providing the training material to employees.

6.1.6.12 Concur (via signature) on MSFC certification forms MSFC Form 4083, "Personnel Certification" and 4083-1, "Temporary Safety Certification," if applicable) to certify that employees have received the required training, experience, and medical exam (if applicable) for certification.

6.1.6.13 Review MSFC Form 4083, "Personnel Certification," MSFC Form 4083-2 "Annual Personnel Certification Statement," and MSFC Form 4083-1, Temporary Safety Certification,

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(as applicable) for safety certifications, and submit to the appropriate MSFC CA or MAF CA for final approval.

6.1.6.14 Use MSFC Form 4333, "Training Requirements Plan" to document OJT Type A for safety specialties.

6.1.6.15 Use MSFC Form 4083, "Personnel Certification" and MSFC Form 4293, "Eye Examination Certification" or an equivalent visual acuity record for skills certifications listed in Chapter 3, and submit to the Mission Systems Assurance and Technical Support Department for final approval with the exception of ESD certifications.

6.1.6.16 Use MSFC Form 4083, "Personnel Certification" for ESD certifications, and submit to the Mission Systems Assurance and Technical Support Department for final approval. MSFC Form 4293, "Eye Examination Certification" is not required for ESD.

6.1.6.17 Reassigns employees to duties not requiring a certification when individuals fail the medical examination, or fail to meet certification requirements.

6.1.6.18 Notify the MSFC CA or MAF CA when an employee no longer requires a safety or skill certification.

6.1.7 Employees shall:

6.1.7.1 When assigned to perform a job/task requiring a safety or skill certification, successfully complete all the requirements listed in Chapters 1 through 7 for the required certification.

6.1.7.2 Complete the employee portion of the MSFC forms required for certification and provide to the supervisor after successfully completing the OJT, SHE training certificates, medical exam, and proficiency testing, if needed.

6.1.7.3 Obtain recertification for the job/task in accordance with Chapters 1 through 7 when needed.

6.1.7.4 Not perform a job/task that requires a safety or skill certification without being certified and listed in CERTRAK.

6.1.7.5 When notified of expiring certification, obtain the required training, medical exam and proficiency testing, if needed.

6.1.8 Training Representatives shall:

6.1.8.1 Be designated training representatives from ISB, EEOH, Mission Systems Assurance and Technical Support Department and other MSFC or MSFC's MAF organizations when needed.

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6.1.8.2 Assist the Certifying Officer and CA in approving the following (as applicable). At MSFC, assist the S&MA Certifying Officer and S&MA CA.

- a. Content of safety training courses and certification requirements.
- b. Training courses that can be substituted for those listed in Chapter 1 and Chapter 6.
- c. Contractor provided safety training courses that can be used in lieu of MSFC-provided or MSFC's MAF-provided safety training courses.

6.1.9 Contractors shall:

6.1.9.1 Evaluate the scope of their contract to identify potentially-hazardous operations and determine which operations or tasks require a safety or skill certification.

6.1.9.2 Complete all the requirements in section 6.1.6 for employee identified as requiring a safety or skill certification.

6.1.9.3 Identify any operations that require training and/or certification in addition to those listed in the Contractor's SHE Plan and/or Personnel Certification Plan. Assist ISB, EEOH, or designee in the determination of the certification requirements, development of training material and providing the training material to employees, as needed.

6.1.9.4 Designate and provide the name of the individual identified to serve as the Contractor's Certifying Officer for safety specialties and skills certifications to the S&MA Certifying Officer, S&MA CA, or MSFC's MAF, CA.

6.1.9.5 Notify the S&MA Certifying Officer, S&MA CA, or MSFC's MAF, CA when the identified Certifying Officer no longer serves as the Contractor Certifying Officer due to retirement, or other means where the contractor's Certifying Officer function is no longer necessary.

6.1.9.6 Designate a safety specialties and skills proficiency examiner, if requested, and submit their names and credentials to the S&MA Certifying Officer, S&MA CA, or MSFC's MAF CA for review, approval and inclusion in CERTRAK. (See 6.1.5.)

6.1.9.7 Ensure a list of their Certifying Officers and Proficiency Examiners are listed in CERTRAK and maintained current for their contract (if applicable).

6.1.9.8 Maintain records of required OJT for the employee as long as the employee holds position for which OJT is required, or in accordance with the NRRS or OSHA standards, whichever time period is longer.

6.1.9.9 Notify ISB, Mission Systems Assurance and Technical Support Department, or designee when an employee no longer requires a safety or skill certification issued by that office (e.g.,

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retires or transfers to another job) to move the employee's name to the inactive file in CERTRAK.

6.1.9.10 Apply for safety certification (via MSFC Form 4083, "Personnel Certification") for the operations performed that are listed in Chapters 1, 2, 6 and 7. (See Chapter 1, CH1.1.4 and Chapter 6, CH6.1.4.)

6.1.9.11 Forward completed MSFC forms (MSFC Form 4083, "Personnel Certification," MSFC Form 4083-2, "Annual Personnel Certification Statement" and MSFC Form 4083-1, "Temporary Safety Certification" if applicable), to the CA for inclusion in CERTRAK. Forward forms to the S&MA CA or MSFC's MAF CA, as applicable.

6.1.9.12 Maintain safety training and certification records for their employees in accordance with the requirements of their approved certification plan(s) to the extent specified in their contract or agreement and this MWI. Certifications are to be maintained in CERTRAK unless specified otherwise in the contract or agreement.

6.1.9.13 Develop training material when requested by ISB for approval and posting in SATERN. The Government can only request the development of training material from the contractor if this task is within the scope of their contract. Training can be provided for MSFC or MSFC's MAF safety certifications.

6.1.9.14 Ensure within one (1) year of new contract start date that certifications for employees that obtained a certification with the previous contractor are updated in CERTRAK to reflect the current contractor. If the contractor fails to update CERTRAK with the current contractor within one (1) year, the employee's certification is moved to the inactive file in CERTRAK. The employee is then required to obtain all training, OJT, and proficiency testing (if applicable) needed to receive the certification.

6.1.9.15 If a contractor was not listed in CERTRAK on a previous contract the employee shall be required to obtain all MSFC training, OJT, and proficiency testing (if applicable) needed to receive the certifications listed in Chapters 1 through 7.

6.1.9.16 MSFC's MAF employees that are listed in the MAF training and certification database for a MAF certification equivalent to those listed in Chapters 6 and 7 can be entered into CERTRAK. The employee shall provide evidence that they have previously taken equivalent MAF training and obtained an equivalent MAF certification.

6.1.9.17 MSFC's MAF employees that cannot provide evidence of equivalent MAF training or MAF certification shall be required to obtain all MSFC and MSFC's MAF training, OJT, and proficiency testing (if applicable) needed to receive the certifications listed in Chapters 6 and 7. A temporary or provisional safety certification can be issued to these employees in accordance with 6.6 until they are able to obtain the required MSFC or MSFC's MAF training if approved.

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6.1.10 The Safety and Mission Assurance (S&MA) representative or designee located at MSFC's MAF shall perform all activities and have all of the responsibilities listed in this MWI for S&MA and ISB.

6.1.11 The MSFC Office of Center Operations representative or designee located at MSFC's MAF shall perform all the activities and have all of the responsibilities listed in this MWI for the Facilities Management Office (FMO), Environmental Engineering and Occupational Health (EEOH) Office, and Logistics Services Office (LSO).

6.2 Certification Process

6.2.1 Employees selected by their supervisors in accordance with paragraph 6.1.6.3 shall attend the required training identified in the appropriate Chapters listing the needed certification.

6.2.1.1 Employees shall provide the necessary MSFC Forms (MSFC Form 4083, "Personnel Certification," MSFC Form 4083-2, "Annual Personnel Certification Statement" and MSFC Form 4083-1, "Temporary Safety Certification" if applicable), to their supervisor indicating completion of required training.

6.2.1.2 Supervisors shall:

- a. Review the completed MSFC forms to ensure the forms contain all required information for safety certifications.
- b. Forward completed MSFC forms to the CA to forward on for final approval. At MSFC, the forms are forwarded to the S&MA CA. At MSFC, the final approval is obtained from the S&MA Certifying Officer.
- c. Return incomplete MSFC forms to the employee to obtain required information.
- d. Contractor supervisors forward completed MSFC forms to the Contractor Certifying Officer for forwarding to the MSFC CA or MSFC's MAF CA.

6.2.1.3 The CA shall forward completed MSFC forms to the S&MA Certifying Officer or designee, as applicable, for approval.

6.2.1.4 The Certifying Officer shall:

- a. Review the MSFC forms and approve or disapprove the certification request. At MSFC, the MSFC forms are reviewed by the S&MA Certifying Officer or designee.
- b. Approve requests forwarded to the MSFC CA or MAF CA for inclusion to CERTRAK as applicable.
- c. Disapprove requests and provide with details or a list of deficiencies why the request for certification cannot be granted and forward to the CA for revision by the supervisor or

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organization's safety representative. At MSFC forward to the S&MA CA and at MSFC's MAF, forward to the MSFC's MAF CA.

6.2.1.5 Supervisors shall review details of any disapproved certification request with the employee.

6.2.1.6 After employees have fulfilled the deficiencies, employee can resubmit the certification request in accordance with paragraph 6.2.1.1.

6.3 Safety Certification

6.3.1 Employees performing operations listed in Chapter 1, 2, 6 and 7 shall be identified by their supervisor in accordance with 6.1.6.2 for certification and obtain the certification prior to performing the operation.

6.3.2 Supervisors of employees who fail the medical exam shall be notified to reassign the employee to other duties until the medical exam has been passed. (See Chapter 1, CH1.1.2 and Chapter 6, CH6.1.2 for additional information.)

6.3.3 Operations performed by contractors that require a safety certification in accordance with this MWI shall be maintained and tracked in CERTRAK unless specified otherwise in the contract or agreement.

6.4 Skills Certification

6.4.1 Skills certification shall be required for, but not limited to, the skills listed in Chapter 3.

6.4.2 Certification for all skills/tasks shall meet the requirements of the process/workmanship specification and/or the certification instruction.

6.4.3 In the absence of established training, experience requirements, or certification intervals, the proficiency examiner or technical advisor shall recommend to the Certifying Officer appropriate requirements.

6.4.4 Other process/workmanship skills that require certification shall be identified to the Certifying Officer.

6.4.5 Operations performed by contractors that require a skill certification in accordance with this MWI shall be maintained and tracked in CERTRAK unless an omission from this requirement is documented in a contract, grant, or written agreement.

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6.5 Proficiency Test

6.5.1 Employees shall demonstrate proficiency (proficiency tests) of the operation where required in Chapter 1 and Chapter 6.

6.5.2 Proficiency tests shall only be conducted after required classroom training (to include written tests where required), medical examination with physician's signature on MSFC Form 4083-2, "Annual Personnel Certification Statement" and completion of either Type A, or Type B OJT.

6.5.3 MSFC Form 4083, "Personnel Certification" and MSFC Form 4083-2, "Annual Personnel Certification Statement" shall be fully complete and checked by the proficiency examiner prior to the employee performing a proficiency test. When classroom training is not available, the current certification can be extended by the Certifying Officer in accordance with 6.6, or written approval until training is offered. At MSFC, this extension is obtained by the S&MA Certifying Officer or designee.

6.5.4 MSFC or MSFC's MAF, certification shall be required to operate MSFC or MSFC's MAF-owned lifting equipment.

6.5.5 When a contractor is required to operate an MSFC or MSFC's MAF-owned lifting equipment but unable to receive the MSFC or MSFC's MAF required training for the certification, a temporary or provisional safety certification can be obtained in accordance with section 6.6.

6.5.6 MSFC or MSFC's MAF certification shall not be required for contractor-owned and contractor-operated lifting equipment.

6.5.7 Contractors shall be able to provide proof of training or qualifications when operating contractor-owned equipment on MSFC or MSFC's MAF property as requested.

6.5.8 Certifications for the operation of MSFC or MSFC's MAF-owned lifting equipment shall be issued for the specific equipment item on which the employee demonstrated proficiency.

6.5.9 Lifting equipment shall be identified by one of the following methods, and the identification number recorded on MSFC Form 4083, "Personnel Certification":

6.5.9.1 Overhead cranes by MSFC or MSFC's MAF maintenance number.

6.5.9.2 Forklifts by class type.

6.5.10 Where MSFC or MSFC's MAF owns two or more equipment items that are identical in manufacturer, model number, and all functional parameters, a single proficiency examination shall qualify the employee to operate all the identical equipment items.

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6.5.11 An employee shall not be considered to be certified to operate any lifting equipment until listed in CERTRAK.

6.6 Temporary or Provisional Safety Certification

6.6.1 Temporary or provisional safety certifications can be issued to contractors or civil service employees that are unable to attend the required training for specified periods of time to perform work.

6.6.2 Contractors shall provide evidence that the employee has experience in the specialty and has received training equivalent to the training required for the MSFC safety certification.

6.6.3 Contractors shall provide rationale to the MSFC CA or MSFC's MAF CA why the employee is unable to attend the MSFC safety training courses required for safety certification.

6.6.4 Temporary or provisional Safety Certifications can be issued by the MSFC CA or MSFC's MAF CA when the provided rationale justifies the need for the temporary or provisional Safety Certification.

6.6.5 Temporary Safety Certifications shall not be issued for more than 12 months.

6.7 CERTRAK Access

6.7.1 Certified personnel, safety representatives, and supervisors who have been granted approval by the CA shall access CERTRAK. Only those employees who have a need are issued a password allowing them to input and edit data. All others including supervisors, managers, and those who have personnel certifications are only allowed to view certifications and the pertinent information such as Proficiency Examiners and Certifying Officers. This access is granted at MSFC by the S&MA CA and at MSFC's MAF, by the MSFC's MAF CA.

6.7.2 Employee certifications can be viewed from the SHE Web page. Select "CERTRAK" from the pulldown menu, then select "View Employee's Certifications."

6.7.3 Employee certification shall be verified by any of the following methods:

6.7.3.1 A printout from CERTRAK maintained by the employee or supervisor listing their certification as current.

6.7.3.2 Employee listed in CERTRAK with a current certification.

6.8 Employee Certification

6.8.1 Employees shall not be considered certified for safety certifications listed in Chapter 1, 2, 6 or 7 until listed in CERTRAK.

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6.8.2 Employees shall not be considered certified for skill certifications listed in Chapters 3, 4 and 5 until completion of any required tests.

6.8.2.1 Employees can be considered certified for skill certifications prior to being listed in CERTRAK.

6.9 OJT

6.9.1 Type A OJT is for certification specialties that require documentation to demonstrate the applicant's qualifications to perform the task. Documentation includes work history (period of performance, description of equipment or operation), signature of supervisor, and applicant.

6.9.1.1 Type A OJT shall be documented on MSFC Form 4333, "Training Requirements Plan" for safety specialties only.

6.9.2 Type B OJT is for certification specialties that require only the signature of the applicant's supervisor. The supervisor's signature provides evidence that enough OJT has been completed to consider the applicant for certification.

6.9.3 Type B OJT shall be documented on MSFC Form 4083, "Personnel Certification in block 18."

6.9.4 For NDE/NDT certifications, documented evidence of OJT (i.e., work experience) shall be maintained in logbooks. The logbooks shall be maintained and stored within the cognizant NDT organization. The logbooks shall be available for inspection upon request.

6.10 Medical Examinations

6.10.1 Medical examinations are required for certain safety certifications listed in Chapter 1, 2, 6 and 7. The depth, scope, frequency, and criteria for the medical examinations for safety certifications have been established by the MSFC medical and health officials in accordance with NPR 8715.3, "NASA General Safety Program Requirements."

6.10.2 Medical examination category criteria and pass/fail criteria shall be maintained at the MSFC Medical Center by OMEH or at MSFC's MAF, by the MAF Medical Center.

6.10.3 Medical examinations shall be conducted in accordance with MPR 1810.1, MSFC Occupational Medicine."

6.10.4 Medical examinations for safety certification shall be scheduled annually unless otherwise noted.

6.10.5 Operations that require a medical examination shall only be performed by employees who pass the medical examination.

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6.10.6 Employees who fail the medical examination shall be assigned to other duties until they are able to pass the medical examination.

6.11 MSFC's MAF Certification

6.11.1 The process and requirements to obtain an MSFC's MAF certification shall be the same process and requirements described in this MWI unless noted otherwise in this section.

6.11.2 An MSFC's MAF certification is equivalent to an MSFC certification for the same type equipment or operation and is accepted for use at MSFC. An MSFC certification is also accepted for the same type equipment or operation at MSFC's MAF.

6.11.3 The Certifying Officer at MSFC MAF is the MSFC S&MA representative located at MAF and performs the functions listed in section 6.1.2.

6.11.4 MSFC's MAF contractors are allowed to have their own Certifying Officers and perform the functions listed in section 6.1.9.

6.11.5 The MSFC S&MA representative located at MSFC's MAF or designee performs the functions listed in section 6.1.3.

6.11.6 The MSFC's MAF Certifying Officer and MSFC's MAF CA shall coordinate with ISB and Mission Systems Assurance and Technical Support Department to review and approve training developed at MSFC's MAF, if applicable.

6.11.7 Training material provided at MSFC's MAF shall be the same training material provided at MSFC unless otherwise approved by S&MA.

6.11.8 MSFC's MAF certifications shall be obtained in accordance with the process defined in this MWI.

7. NOTES

None

8. SAFETY PRECAUTIONS AND WARNING NOTES

None

9. RECORDS

9.1 The following records shall be maintained in accordance with NRRS 3/33/G/2 [3400] by the S&MA CA or MSFC's MAF CA. Destroy 5 years after separation of employee or when no longer needed.

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9.1.1 Evidence of personnel qualifications (e.g., MSFC Form 4333, "Training Requirements Plan" used for safety specialties only, exam reports, letters from training organizations).

9.1.2 CERTRAK records.

9.1.3 List of certified personnel.

9.1.4 List of Proficiency Examiners and Certifying Officers.

9.1.5 NDT logbook when required to establish experience history (employee).

9.1.6 Equivalent NDT work experience. (See CH4.3.9.)

9.2 OJT records shall be maintained by the supervisor in accordance with NRRS 3/33/H/1. Destroy on transfer or separation of employee, or when 5 years old, whichever is sooner.

9.3 Completed MSFC Form 4083, "Personnel Certification," MSFC Form 4083-1, "Temporary Safety Certification," MSFC Form 4083-2, "Annual Personnel Certification Statement," and MSFC Form 4293, "Eye Examination Certification." MSFC Form 4083-2, "Annual Personnel Certification Statement," shall be maintained by ISB for MSFC. At MSFC's MAF, the MSFC Form 4083-2 is maintained by the MSFC's MAF, Medical Center.

9.4 Safety Training records, when required, shall be maintained in accordance with the following:

9.4.1 Civil service authorized employee training records shall be maintained by the Training and Incentives Office in the Web-based System for Administration Training and Education Resources for NASA (SATERN). Contact the Training and Incentives Office for more information on SATERN.

9.4.2 Contractor-authorized employee training records for those contractors given access to SATERN shall be maintained by the Training and Incentives Office in SATERN.

9.4.3 Contractors shall maintain employees OJT and training records for training classes not registered through SATERN.

10. PERSONNEL TRAINING AND CERTIFICATION

None

11. FLOW DIAGRAM

(See "Certification Flowchart.")

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12. CANCELLATION

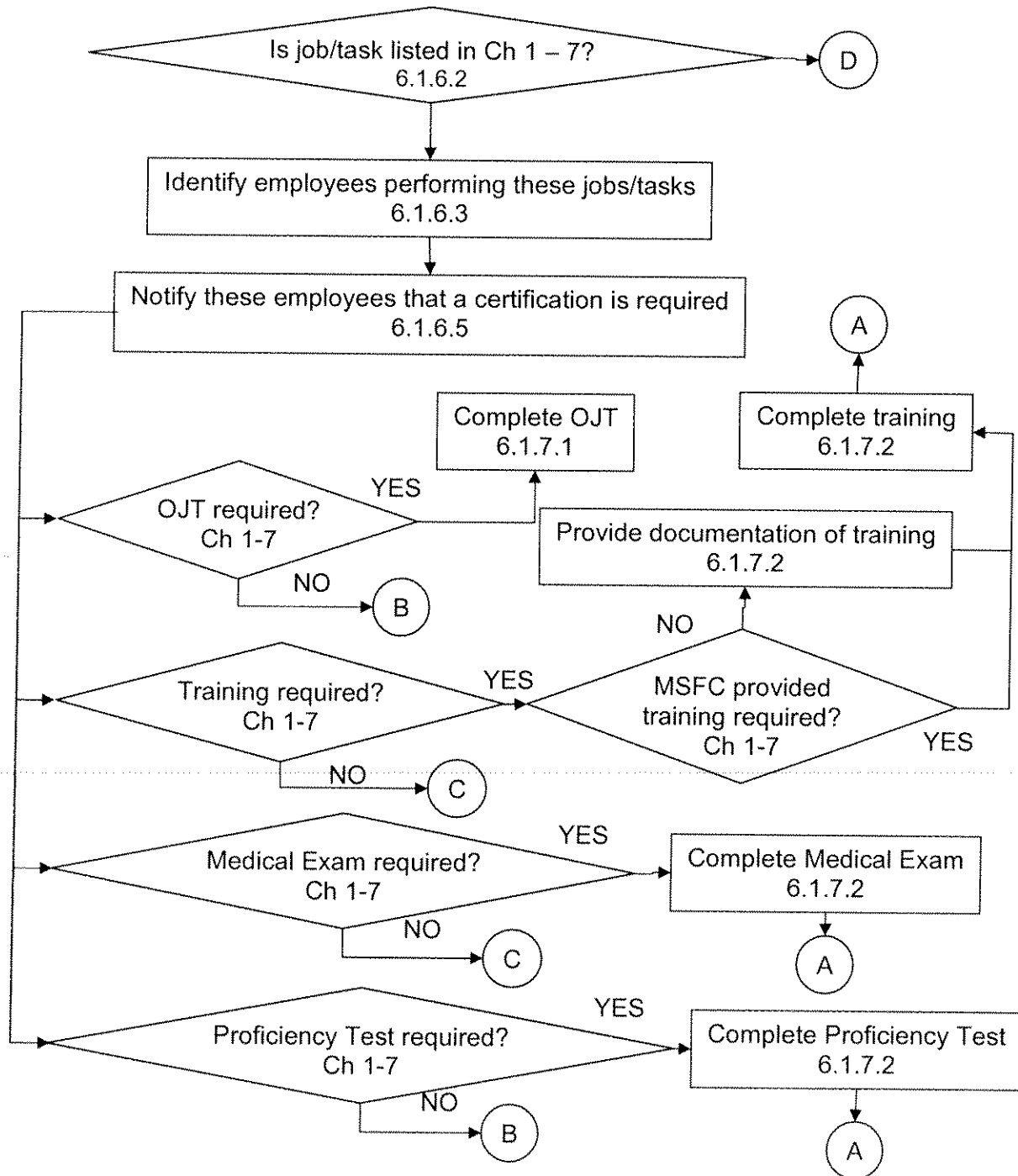
MWI 3410.1H dated October 10, 2007

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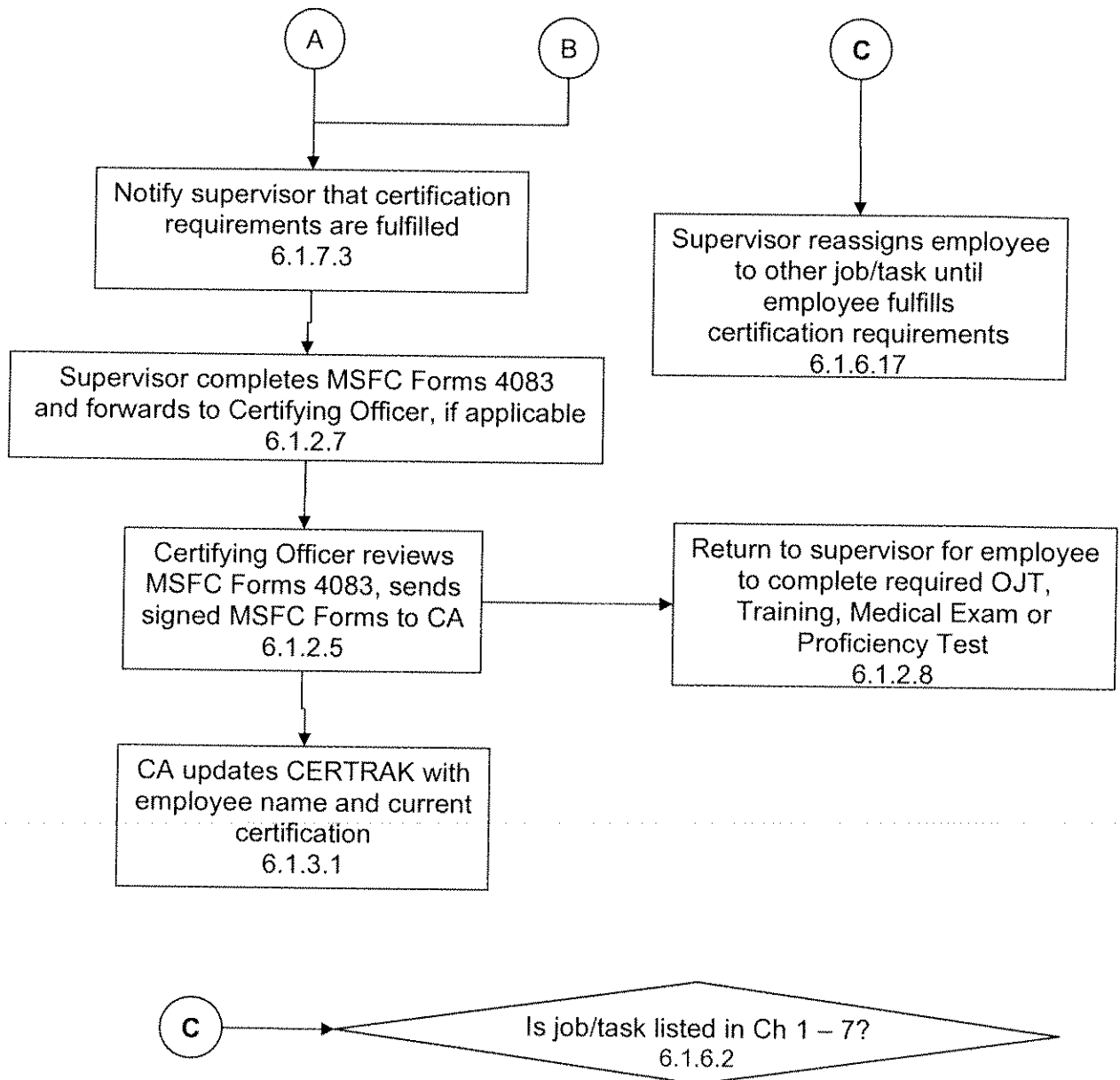
David A. King
Director

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CERTIFICATION FLOWCHART



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CHAPTERS

CHAPTER 1. MSFC Safety Certification Requirements

CHAPTER 2. Training Not Provided by MSFC

CHAPTER 3. Skills That Require Certification

CHAPTER 4. NAS Certification and Qualification of Nondestructive Test Personnel. Written Practice in Accordance with National Aerospace Standard (NAS) 410 Rev 2, 2003 Edition

CHAPTER 5. EPS

CHAPTER 6. Safety Certification Requirements for MSFC's MAF

CHAPTER 7. Training Not Provided by MSFC's MAF

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CHAPTER 1

MSFC SAFETY CERTIFICATION REQUIREMENTS

CH1.1 Safety Certification Requirements are identified in Table CH1-1 below.

TABLE CH1-1 MSFC SAFETY CERTIFICATION REQUIREMENTS			
CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTIFICATION PERIOD	RECERTIFICATION REQUIREMENTS
Aerial Lift Operator <ul style="list-style-type: none"> • Boom-Supported • Bucket Truck • Vertical [29 CFR Part 1910.67; 29 CFR Part 1926.453 and NASA-STD-8719.9] (See CH1.1.4.)	<ul style="list-style-type: none"> • Aerial Platform Training (SMA-SAFE-NSTC-0030), Manufacturer's Course or (SHE 509) • Fall Protection (SMA-SAFE-NSTC-0311) or (SHE 113) • Type B OJT • Written and Proficiency Tests • Medical exam – Category I 	4 Years	<ul style="list-style-type: none"> • Refresher Training (SMA-SAFE-NSTC-0030) or SHE 509) • Proficiency Test • Medical exam – Category I
Confined Space Entry [29 CFR Part 1910.146 and MPR 1840.1]	<ul style="list-style-type: none"> • Confined Space Entry Training (SHE 209A) • Written Test • Medical exam – Category IV 	1 Year	<ul style="list-style-type: none"> • Refresher Training (SHE 209B) • Medical exam – Category IV
Cryogen System Operator (See CH1.1.4.)	<ul style="list-style-type: none"> • Cryogenic Safety (SMA-SAFE-NSTC 0313) or (SHE 124) • HazCom (SHE 214) • Type A OJT (40 Hours) • Medical exam – Category III 	4 Years	<ul style="list-style-type: none"> • Refresher Training (SMA-SAFE-NSTC 0313) or (SHE 124) • Medical exam – Category III
Forklift Operator: <ul style="list-style-type: none"> • Class 1: Electric Motor, Sit-Down Rider, Counter-Balanced Trucks (Solid and Pneumatic Tires) • Class 2: Electric Motor Narrow Aisle Trucks (Solid Tires) • Class 3: Electric Motor Hand Trucks or Hand/Rider Trucks (Solid Tires) • Class 4: Internal Combustion Engine Trucks (Solid Tires) • Class 5: Internal Combustion Engine Trucks (Pneumatic Tires) • Class 6: Electric and Internal Combustion Engine Tractors (Solid and Pneumatic Tires) • Class 7: Rough Terrain Forklift Trucks (Extended Boom) Trucks [NASA STD 8719.9 and MWI 6430.1] (See CH1.1.4.)	<ul style="list-style-type: none"> • Forklift Safety (SMA-SAFE-NSTC 0210) or (SHE 505) • Shall be 18 years old to operate • PCH Training for PCH Certification. (SHE 500) If required to move PCH • Written and Proficiency Tests • Type A OJT for PCH/Critical • Type B OJT otherwise • Medical exam – Category I • Current certification as a Forklift Operator • Study of Manufacturer's Operator's Manual • Hands-on orientation from certified operator • Medical exam – Category I • Proficiency Test 	3 Years	<ul style="list-style-type: none"> • Refresher Training (SMA-SAFE-NSTC 0210) or (SHE 506) • Shall be 18 years old • Medical exam – Category I • Proficiency Test • Review Manufacturer's Operator's Manual • Medical exam – Category I • Proficiency Test

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TABLE CH1-1 MSFC SAFETY CERTIFICATION REQUIREMENTS

CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTI- FICATION PERIOD	RE-CERTIFICATION REQUIREMENTS
Hazardous Waste Operations and Emergency Response (HAZWOPER) Technician [NPR 8715.3]	<ul style="list-style-type: none"> HAZWOPER (40 Hours) (SHE 303) Medical exam-Category III 	1 Year	<ul style="list-style-type: none"> HAZWOPER Management Refresher (8 Hours) (SHE 308) Medical exam- Category III
HAZWOPER Incident Commander [NPR 8715.3]	<ul style="list-style-type: none"> HAZWOPER with an Incident Command Element Training (40 Hours) (SHE 314) Medical exam – Category III 	1 Year	<ul style="list-style-type: none"> HAZWOPER with an Incident Command Element Training Refresher (8 Hours) (SHE 315) Medical exam – Category III
High Pressure System Operator (> 150 psig) (liquid/vapor/gas) [NPR 8715.3] (See CH1.1.1.)	<ul style="list-style-type: none"> Safety in High Pressure Operations (SMA-SAFE-NSTC-0317) Medical exam – Category III 	4 Years	<ul style="list-style-type: none"> Refresher training (SMA-SAFE-NSTC- 0317) Medical exam – Category III
High Voltage Electrician Safety [NPR 8715.3]	<ul style="list-style-type: none"> Power Transmission and Distribution (SMA-SAFE-NSTC-0075) or equivalent High Voltage safety course Medical exam – Category III CPR 	4 Years	<ul style="list-style-type: none"> Refresher Course (Electrical Safety Refresher SMA-SAFE- NSTC-0310 or equivalent) Medical exam – Category III
Hydrogen System Operator (See CH1.1.5.)	<ul style="list-style-type: none"> Safety in Hydrogen System Operations (SMA-SAFE-NSTC- 0054) HazCom (SHE 214) Medical exam – Category III Type A OJT (40 hours) 	4 Years	<ul style="list-style-type: none"> Refresher Training (SMA-SAFE-NSTC- 0054) Medical exam – Category III
KAMAG TM Operator/Flagman (See CH1.1.4.)	<ul style="list-style-type: none"> KAMAGTM Operation Training Course (SHE 511) Valid state-issued commercial drivers license (CDL), Class A Valid Department of Transportation (DOT) Medical Card Type A OJT for PCH Type B OJT otherwise Proficiency Test Medical exam – Category I 	4 Years	<ul style="list-style-type: none"> Refresher Training (SHE 511) Proficiency Test Medical exam – Category I Valid state-issued CDL, Class A Valid DOT Medical Card
Laser Maintenance Personnel [MPD 1860.1, ANSI Z136.1 and NPR 8715.3]	<ul style="list-style-type: none"> Laser Safety Course (SHE 216) Lockout/Tagout (SMA-SAFE-NSTC- 0814) or (SHE 128) Medical exam – Category V 	1 Year	<ul style="list-style-type: none"> Refresher Training (SHE 216) Medical exam – Category V
Laser Operator (> Class 3b or 4) [MPD 1860.1, ANSI Z136.1 and NPR 8715.3]	<ul style="list-style-type: none"> Laser Safety Course (SHE 216) Medical exam – Category V Initial and Exit Ophthalmology Exam 	1 Year	<ul style="list-style-type: none"> Refresher Training (SHE 216) Medical exam – Category V

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TABLE CH1-1 MSFC SAFETY CERTIFICATION REQUIREMENTS

CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTI- FICATION PERIOD	RECERTIFICATION REQUIREMENTS
Liquid Nitrogen System Operator [NPR 8715.3] (See CH1.1.5.)	<ul style="list-style-type: none"> Liquid Nitrogen Handlers Course Employees working with less than 250 gallon dewars (SMA-SAFE-NSTC-0314) or (SHE 123) Cryogenic Safety Employees working with more than 250 gallon dewars (SMA-SAFE-NSTC-0313) or equivalent (SHE 124) HazCom (SHE 214) Medical exam – Category III Type A OJT (40 hours) 	4 Years	Refresher training (SMA-SAFE-NSTC-0314) or (SHE 123) <ul style="list-style-type: none"> Medical exam – Category III
Lockout/Tagout, Authorized Employee [MWI 8715.2 and 29 CFR Part 1910.147]	<ul style="list-style-type: none"> Lockout/Tagout (SMA-SAFE-NSTC-0814) or (SHE 128) Written Test 	4 Years	<ul style="list-style-type: none"> Refresher Training (SHE 128) Written Test
Mobile Crane Operator – including Derrick Crane Operator [NASA STD 8719.9 and MWI 6430.1] (See CH1.1.4.)	<ul style="list-style-type: none"> Mobile Crane Safety (SMA-SAFE-NSTC-0208) or (SHE 516 for Mobile Crane or SHE 518 for Derrick Crane) PCH Training for PCH Certification (SHE 500) if required to move PCH Type A OJT for PCH/Critical Type B OJT otherwise Written and Proficiency Tests Medical exam – Category I Mobile Crane only – CDL required for travel on roadway 	4 Years	<ul style="list-style-type: none"> Refresher Training (SHE 516 or SHE 518) Medical exam – Category I Proficiency test Valid CDL and DOT medical card
Overhead Crane/Hoist Operator – including Portal Crane Operator [NASA STD 8719.9 and MWI 6430.1]	<ul style="list-style-type: none"> Overhead Cranes and Materials Handling (SMA-SAFE-NSTC-0205) or (SHE 507 for overhead/hoist and Portal Crane) PCH Training for PCH Certification (SHE 500) If required to move PCH Type A OJT for PCH/Critical Type B OJT otherwise Written and Proficiency Tests Medical exam – Category I 	4 Years	<ul style="list-style-type: none"> Refresher Training (SMA-SAFE-NSTC-0028) or (SHE 508) Medical exam – Category I Proficiency Test
Oxygen System Operator (See CH1.1.4 and CH1.1.5.)	<ul style="list-style-type: none"> Oxygen Systems: Operation and Maintenance (SMA-SAFE-NSTC-0053) or (SHE 131) HazCom (SHE 214) Medical exam – Category III Type A OJT (40 Hours) 	4 Years	<ul style="list-style-type: none"> Refresher training (SMA-SAFE-NSTC- 0053) or (SHE 131) HazCom Refresher (SHE 214) Medical exam – Category III
PCH Handler– Employees involved in the actual hands-on PCH move such as hand carry (manual move) and operating lifting and moving equipment. Employees that monitor and are not directly involved the in hands-on operation only need monitor training (SHE 504). [MWI 6410.1]	<ul style="list-style-type: none"> PCH Training, (SHE 500) Medical exam – Category I 	3 Years	<ul style="list-style-type: none"> Refresher Training (SHE 500) Medical exam – Category I

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TABLE CH1-1 MSFC SAFETY CERTIFICATION REQUIREMENTS

CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTI- FICATION PERIOD	RE-CERTIFICATION REQUIREMENTS
Propellant and Explosive Handler/User [NSS 1740.12 and MWI 8715.10]	<ul style="list-style-type: none"> Basic Explosive Safety (SMA-SAFE-NSTC-0082) or (SHE 111) Type A OJT (40 Hours) Medical exam – Category III 	3 Years	<ul style="list-style-type: none"> Refresher training (Refresher Course for Explosive Handlers and Operational Personnel, (SMA-SAFE-NSTC-0009) or (SHE 111) Medical exam – Category III
Propellant and Explosive Inspector	<ul style="list-style-type: none"> Basic Explosive Safety (SMA-SAFE-NSTC-0082) or (SHE 111) Proficiency with QD-QA-019 Type A OJT (80 Hours) Medical exam – Category III 	3 Years	<ul style="list-style-type: none"> Refresher training (Refresher Course for Explosive Handlers and Operational Personnel, (SMA-SAFE-NSTC-0009) or (SHE 111) Medical exam – Category III
Radiation – Personnel designated to wear dosimeters or designated as “authorized user” [MPR 1860.1 and MPD 1860.2]	Radiation – Ionizing Radiation Producing Devices (SHE 228)	1 Year	<ul style="list-style-type: none"> Refresher training (SHE 228)
Respirators (Non-SCBA) – Personnel designated to wear respiratory protection [MPD 1840.3]	<ul style="list-style-type: none"> Respirator Training (SHE 212) Medical exam – Category IV 	1 Year	<ul style="list-style-type: none"> Refresher training (SHE 212) Medical exam – Category IV
Rigger [NASA STD 8719.9] (See CH1.1.4.)	<ul style="list-style-type: none"> Lift Riggers Course (Contact ISB) Written and Proficiency Tests Type A OJT for PCH/Critical Type B OJT otherwise Medical exam – Category I PCH Training for PCH Certification (SHE 500) 	4 Years	<ul style="list-style-type: none"> Refresher Course (Contact ISB) Medical exam – Category I Proficiency Test
Self-Contained Breathing Apparatus (SCBA) – Personnel designated to wear self-contained breathing apparatus respiratory [MPD 1840.3]	<ul style="list-style-type: none"> SCBA Training (SHE 212) Medical exam – Category IV 	1 Year	<ul style="list-style-type: none"> Refresher training (SHE 212) Medical exam – Category IV
Welding Safety [NPR 8715.3] (See CH1.1.4.)	<ul style="list-style-type: none"> Welding and Cutting (SMA-SAFE-NSTC-0064) or equivalent (SHE 137) Medical exam – Category III 	4 Years	<ul style="list-style-type: none"> Refresher training (SMA-SAFE-NSTC-0064 or equivalent) (SHE 137) Medical exam – Category III

CH1.1.1 Employees working with compressed gas cylinders or compressed gas trailers are not required to have High Pressure Systems Operators certification. These employees are required to take the appropriate safety awareness training, Compressed Gas Cylinder Safety (SMA-SAFE-NSTC-0319) or Compressed Gas Trailer Safety (SMA-SAFE-NSTC-0318).

CH1.1.2 Employees who fail medical exams, for a certification specialty, are given a provisional 3-months time period, whereby their certification is moved to the inactive file. During the 3-months time period, a screening process is performed by the MSFC Medical Center to determine if the medical condition has been corrected. If the condition has been corrected, the certification

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shall be moved to the active status. If the condition has not been corrected, the certification shall remain in the inactive status. This process is tracked in CERTRAK.

CH1.1.3 Contractors shall obtain the MSFC certifications appropriate for the activities being performed, that require the MSFC certification listed in Chapter 1, and have the certified employee listed in CERTRAK. If a contractor believes they are currently excluded from this requirement, they are to contact their MSFC CO to obtain documentation of exclusion from this requirement in their current contract. All future and renewed contracts shall include these certification requirements. Contact the ISB if more information is needed.

CH1.1.4 SHE equivalent courses are still in development. Equivalent courses developed by contractors shall be approved by the SHE Training Subcommittee exclusively for use by that contractor. Contact the ISB for information if you are unable to locate a SHE training course listed.

CH1.1.5 High Pressure System Operators, Hydrogen System Operators, and Oxygen System Operators can elect to attend the extended training courses, Safety in High Pressure Systems, Hydrogen Safety, and Fire Hazards in Oxygen Systems (as applicable).

CH1.1.6 Certifications can expire, be suspended, or be revoked. Certification shall expire when employment is terminated or when the certification interval has lapsed with no recertification issued.

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CHAPTER 2

TRAINING NOT PROVIDED BY MSFC

CH2.1 State, Federal, and Other provided training requirements are identified in Table CH2-1 below.

TABLE CH2-1 STATE, FEDERAL, AND OTHER TRAINING REQUIREMENTS			
CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTIFICATION PERIOD	RECERTIFICATION REQUIREMENTS
Asbestos Abatement for asbestos/heavy metal: • Supervisor • Worker [Alabama Asbestos Contractor Accreditation Act (89-517); 40 CFR Part 1910.1001 and 1926.1101]	<ul style="list-style-type: none"> • State Accredited Training [State Registration, Safe State (1-800-452-5928)] • Supervisor State-Accredited Course • Worker State-Accredited Course • Medical exam 	1 Year	<ul style="list-style-type: none"> • State-Accredited Refresher Course • Medical exam
Asbestos Operations and Maintenance (Class III) [40 CFR Part and 1910.1001 and 1926.1101]	<ul style="list-style-type: none"> • State Accredited Training [State Registration, Safe State (1-800-452-5928)] 	1 Year	<ul style="list-style-type: none"> • State-Accredited Refresher Course
Commercial Motor Vehicle Operator • Class A >26,001 lbs • Class B <26,000 lbs • Class C • Hazardous Material endorsement • Tanker endorsement • Hazardous Material/Tanker endorsement • Air Brakes restriction	<ul style="list-style-type: none"> • Valid Department of Transportation (DOT) Medical Card (requires medical examination; valid for 2 years) – Category Ia • Valid state-issued Commercial Driver License (CDL) 	4 Years	<ul style="list-style-type: none"> • Copy of renewed state-issued CDL • Copy of renewed DOT Medical Card
Flight Deck Crew	<ul style="list-style-type: none"> • Appropriate FAA license and certification • Medical exam 	Determined by FAA	<ul style="list-style-type: none"> • FAA requirements • Medical exam
Heavy Equipment Operator (earth-moving equipment) [NPR 8715.3] Mobile Sweeper Operator (See CH2.1.2 and CH2.1.3.)	<ul style="list-style-type: none"> • Valid state-issued CDL, Class A or B • Valid DOT Medical Card • Medical exam • Type B OJT 	4 Years	<ul style="list-style-type: none"> • Valid state-issued CDL • Valid DOT Medical Card • Medical exam
Hydraset Operator [NASA 8719.9] (See CH2.1.2 and CH2.1.3.)	<ul style="list-style-type: none"> • Manufacturer's Course or equivalent • PCH Training for PCH Certification (SHE 500) • Type A OJT for PCH/Critical • Type B OJT otherwise • Written and Proficiency Tests • Medical exam 	4 Years	<ul style="list-style-type: none"> • Refresher Training • Proficiency Test • Medical exam

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Lifting Equipment Examiner (Proficiency Test Examiner for the following:) Forklift Mobile Crane Overhead Cranes/Aerial Lifts Rigging KAMAG™, Portal Crane, Derrick Crane Hydraset	<ul style="list-style-type: none"> • Associated Train-the-Trainer Certified Course or equivalent when approved by MSFC ISB • Medical exam • Supervisor Statement verifying experience/OJT submitted to S&MA for review/approval 	3 Years	<ul style="list-style-type: none"> • Associated Train-the-Trainer Recertification Course, or equivalent when approved by MSFC ISB • Medical exam
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CH2.1.1 Training specialties in Table CH2-1 do not require MSFC Forms 4083, "Personnel Certification" or 4083-2, "Annual Personnel Certification Statement."

CH2.1.2 Contractor Safety Representatives shall ensure employees are compliant with State, Federal, and other regulations (as applicable). If a contractor believes they are currently excluded from this requirement, they are to contact their MSFC CO to obtain documentation of exclusion from this requirement in their current contract. All future and renewed contracts shall include these certification requirements. Contact the ISB if more information is needed.

CH2.1.3 SHE-equivalent courses are still in development. Equivalent courses developed by contractors shall be approved by the SHE Training Subcommittee exclusively for use by that contractor. Contact the ISB for information if you are unable to locate a SHE training course listed.

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CHAPTER 3

SKILLS THAT REQUIRE CERTIFICATION

CH3.1 Skills that require certification are identified in Table CH3-1 below.

CH3-1. <u>SKILLS THAT REQUIRE CERTIFICATION</u>		
SKILL/TASK	REQUIREMENTS	SHE COURSE NUMBERS
Penetrant Testing	Chapter 4	SHE 401
Magnetic Particle Testing	Chapter 4	SHE 402
Eddy Current Testing	Chapter 4	SHE 403
Ultrasonic Testing	Chapter 4	SHE 404
Radiographic Testing	Chapter 4	SHE 405
Thermal/Infrared Testing (Thermography)	Chapter 4	SHE 406
Visual Testing	Chapter 4	SHE 407
Soldering including SMT	Chapter 5	SHE 410
Staking and Conformal Coating	Chapter 5	SHE 411
Cabling, Harnessing, and Wiring	Chapter 5	SHE 412
Crimping	Chapter 5	SHE 412
ESD Control	Chapter 5	SHE 413

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CHAPTER 4

NAS CERTIFICATION AND QUALIFICATION OF NONDESTRUCTIVE TEST PERSONNEL

Written Practice in Accordance with *National Aerospace Standard (NAS) 410 Rev 2, 2003 Edition*

CH4.1 Purpose

This written practice establishes the minimum requirements for qualification and certification of MSFC personnel who perform NDT/NDE while in the employment of NASA. These requirements cover education, training, experience level, qualification, examination, and certification of NDE personnel. This written practice establishes the qualification requirements, maintenance of skill levels, and examination of individuals seeking certification for the following levels for each NDT method:

Level I
Level II
Level III

CH4.1.1 Applicability. The effective date of this written practice is August 31, 2006. This written practice applies to MSFC personnel performing NDT methods to test and/or accept materials, products, components, or systems related to flight hardware, flight-associated hardware, mission-essential or critical ground support equipment, piping, and pressure vessels. This also applies to NDE personnel who are responsible for offering technical assistance to contractors, other NASA Centers, and Project Offices. This written practice is not intended to apply to individuals with administrative duties or to individuals performing research and development of technology slated for later use by qualified and certified NDE personnel. This written practice does not apply to personnel who perform radiographic inspection of electrical, electronic, and electromechanical parts.

CH4.1.2 Common Methods. The NDT methods covered by this written procedure are: Penetrant testing (PT), Magnetic particle testing (MT), Eddy current testing (ET), Ultrasonic testing (UT), Radiographic testing (RT), as used in accordance with the applicable codes, standards, specifications, and regulations for that method.

CH4.1.3 Other Methods. This written practice also applies to other NDT methods such as acoustic emission, computed tomography, terahertz imaging, backscatter x-ray, magnetic resonance imaging, microwave testing, infrared, or any other NDE method that can be used to determine the acceptability of materials, products, components, or systems related to flight hardware, flight-associated hardware, mission-essential or critical ground-support equipment, piping, and pressure vessels. The requirements for personnel education, training, experience, and examination for these other methods shall be established by the cognizant NDT organization. Guidelines established for the methods listed in CH4.1.2 are acceptable for use.

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CH4.2 Requirements of Qualification

There are four basic levels of qualification that shall apply to NDE personnel employed by NASA at MSFC: Trainee, Level I, Level II, and Level III. The requirements in section CH4.2 and CH4.3 shall be met before certification can be issued.

CH4.2.1 Trainee: An individual who is participating in a training program for an NDT method and is not certified. A trainee shall:

CH4.2.1.1 Obtain work experience under the guidance of a certified Level II or Level III in that same method.

CH4.2.1.2 Not independently conduct tests.

CH4.2.1.3 Not make acceptance or rejection decisions.

CH4.2.1.4 Not independently perform any other NDT function.

CH4.2.2 Level I individuals shall:

CH4.2.2.1 Have the skills and knowledge to process parts and perform equipment standardization in accordance with written procedures approved by the appropriate Level III.

CH4.2.2.2 Have the skills and knowledge to carry out any necessary preparation of parts before or after inspection in accordance with written procedures approved by the appropriate Level III.

CH4.2.2.3 Be able to follow written procedures and instructions in the techniques/methods for which certified.

CH4.2.2.4 Receive guidance or supervision from Level II or Level III in that method when necessary.

CH4.2.2.5 Pass the Level I training course for the method in which certification is sought.

CH4.2.3 Level II individuals shall:

CH4.2.3.1 Have the skills and knowledge to set up and standardize equipment, conduct tests, interpret and evaluate for acceptance or rejection, and document results.

CH4.2.3.2 Be thoroughly familiar with the scope and limitations of the method in which they are certified.

CH4.2.3.3 Be capable of providing the necessary guidance and/or supervision to trainees and Level I personnel in the method in which they are certified.

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CH4.2.3.4 Be familiar with the codes, standards, procedures, and other documents that control the method of inspection as utilized by NASA.

CH4.2.3.5 Be capable of developing written instructions from approved general procedures. These instructions shall require final approval by a Level III.

CH4.2.3.6 Have a basic knowledge of product manufacturing and inspection technology.

CH4.2.3.7 Pass the Level II training course for the method in which certification is sought.

CH4.2.4 Level III individuals shall:

CH4.2.4.1 Have the skill and knowledge to interpret codes, standards, and other governing documents that control the NDT method(s) as utilized by NASA.

CH4.2.4.2 Be capable of assuming technical responsibility for the NDT facilities related to a specific method of inspection.

CH4.2.4.3 Be capable of selecting the method and technique for a specific inspection.

CH4.2.4.4 Be capable of preparing and verifying the adequacy of procedures in the method certified.

CH4.2.4.5 Approve NDT procedures and other NDT related work instructions for technical adequacy in the method in which they are certified.

CH4.2.4.6 Have a general knowledge of other NDT methods and product technologies utilized by NASA.

CH4.2.4.7 Be capable of providing or directing training, examination, and certification of personnel in the method in which they are certified.

CH4.2.4.8 Conduct NDT for the acceptance or rejection of parts only when a demonstration of proficiency in this method was included in the practical examination.

CH4.2.4.9 When required, be capable of auditing contractors to ensure that NDT requirements of NAS 410, and other governing documents, are met.

CH4.2.4.10 Pass the Level III training course for the method in which certification is sought.

CH4.2.5 NDE Instructors/Examiners shall have the skills and knowledge to plan, organize, and present classroom, practical exercises, or OJT in accordance with approved course outlines. This function is usually performed by an outside agency responsible for training. However, the responsible Level III also can serve as the instructor/examiner for the applicable NDT method(s).

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CH4.2.6 NDE Witnesses shall have completed the initial training hours in Table CH4-1 and 25 percent of the experience level values in Table CH4-2, herein per the applicable certification level and NDT method.

CH4.2.7 Responsible Level III individuals shall:

CH4.2.7.1 Be identified in writing by the employer.

CH4.2.7.2 Be certified as a Level III prior to receiving the "Responsible Level III" designation by the employer.

CH4.2.7.3 Be responsible for the implementation of this written practice and the overall administration of the qualification and certification program per applicable NDT method(s).

CH4.2.7.4 Be knowledgeable of the specifications, standards, codes, techniques, and products associated with the aerospace industry and used by the employer.

CH4.3 Training and Experience

CH4.3.1 Candidates for certification as Level I, Level II, or Level III shall complete sufficient organized classroom training, as administered by the outside agency, to become proficient with the principles and practices of the applicable inspection method(s).

CH4.3.2 Training shall be conducted in accordance with a detailed course outline approved by the cognizant NDT organization.

CH4.3.3 At a minimum, the training shall cover basic theory, test principles, products, equipment operation and calibration, safety, operating procedures, applicable techniques, applicable specifications, codes, and written instructions used by NASA.

CH4.3.4 The course outline shall include a list of references from which the training material is derived.

CH4.3.5 General, Specific, and Practical examinations shall be administered by an outside organization or the responsible Level III.

CH4.3.6 Outside Agency

CH4.3.6.1 The outside agency shall provide the S&MA Certifying Officer with the names, qualifications, and certifications held by the instructors and test administrators contracted in the examination and training process.

CH4.3.6.2 The outside agency can qualify but not certify employer personnel.

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CH4.3.7 Health And Safety Training

CH4.3.7.1 Safety-related training requirements shall be determined by NASA.

CH4.3.7.2 As a minimum, all candidates seeking certification in RT shall have received instructions and classroom training on the hazards and safety requirements associated with ionizing radiation and be familiar with applicable regulations and laws prior to certification.

CH4.3.7.3 This training shall be provided by NASA.

CH4.3.8 Minimum Required Classroom Training Hours

CH4.3.8.1 All NDE training shall be documented. The minimum training hours for Level I and Level II are given in Table CH4-1 for the specified methods.

CH4.3.8.2 There are no additional classroom training hours needed to progress from a Level II to a Level III.

CH4.3.8.3 Individuals shall not be certified to Level III without having prior certification and/or work performance as a Level II.

TABLE CH4-1: Minimum Classroom Training Hours

METHOD	LEVEL I	LEVEL II (with Level I experience)	LEVEL II (without Level I experience)
PT	16	16	32
MT	16	16	32
ET	40	40	80
UT	40	40	80
RT	40	40	80
Thermal/Infrared Testing	32	34	66
Visual Testing	8	16	24

CH4.3.9 Minimum Work Experience

CH4.3.9.1 Candidates for Level I, Level II, or Level III certification shall have sufficient practical hands-on experience to assure they are capable of performing the duties of the level for which certification is sought.

CH4.3.9.2 The minimum experience requirements for Level I and Level II are provided in Table CH4-2, while the minimum requirements for Level III are provided in Table CH4-3.

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TABLE CH4-2: Minimum Practical Work Experience Hours

METHOD	EXPERIENCE TIME IN HOURS		
	LEVEL I (with Trainee experience)	LEVEL II (with Level I experience)	LEVEL II (without Level I experience)
PT	130	270	400
MT	130	400	530
ET	400	1200	1600
UT	400	1200	1600
RT	400	1200	1600
Thermal/Infrared Testing	210	1260	1470
Visual Testing	70	140	210

CH4.3.9.3 Experience in multiple methods can be accumulated simultaneously.

CH4.3.9.4 Experience hours in primary method shall be at least 50 percent of the values listed above with remaining time in other methods, as approved by the responsible Level III.

TABLE CH4-3: Minimum Education and Work Experience Hours for Level III

EDUCATION	LEVEL II EXPERIENCE
High School	4 years
Two years of engineering or science study at an accredited technical school, college, or university	2 years
Graduate or at least successful completion of at least 3 years accredited science or engineering program	1 year

CH4.4 Examinations

CH4.4.1 Examinations to verify near vision, color perception, and technical qualifications of candidates shall consist of a visual acuity examination, a general examination, a specific examination, and a practical (and/or written for Level III) examination for each method in which the candidate is to be certified.

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CH4.4.2 The requirements for the vision examination, the questions used for the general and specific examinations, and the checklist for the practical examination shall be available for review by the S&MA Certifying Officer.

CH4.4.3 Visual Acuity

CH4.4.3.1 All candidates for certification shall be given an annual vision examination by the MSFC Medical Center and meet the near vision and color perception requirements listed in Table CH4-4.

CH4.4.3.2 Near vision and color perception tests shall be administered prior to certification or recertification.

CH4.4.3.3 The results shall be documented on MSFC Form 4293, "Eye Exam Certification" or an equivalent visual acuity record, and a copy of the completed form shall be submitted to MSFC Mission Systems Assurance and Technical Support Department.

CH4.4.3.4 Any limitations in color perception shall be evaluated by the Responsible Level III prior to certification and shall be approved in writing.

CH4.4.3.5 For Ultrasonic and Eddy Current methods, this requirement can be relaxed to Jaeger No. 2, provided it is approved and documented by the responsible Level III.

TABLE CH4-4: Vision Requirements

EXAM	REQUIREMENTS
Near Vision	Jaeger No. 1 or equivalent, at a distance not less than 14 inches in at least one eye, natural or corrected
Color Perception	Personnel shall be capable of distinguishing and differentiating colors used in the process involved

CH4.4.4 General Examination

CH4.4.4.1 The general examination for all Levels shall be a closed-book examination consisting of questions that comprise a cross-section of the applicable method at the appropriate Level.

CH4.4.4.2 A minimum of 40 questions shall be administered for Level I, Level II, or Level III.

CH4.4.4.3 For Level III, the questions shall address the general knowledge of other NDE methods used by NASA, as well as the method in which certification is sought. Possession of a current ASNT NDT, EN 473, or ISO 9712 Level III certificate of completion can be satisfactory evidence that the General examination requirements have been met.

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CH4.4.5 Specific Examination

CH4.4.5.1 The specific examination for all Levels shall be closed-book examination consisting of questions that cover the requirements and use of the specifications, operating procedures, equipment, and techniques that the candidate uses while employed by NASA.

CH4.4.5.2 A minimum of 30 questions shall be administered for Level I, Level II, or Level III. Reference materials, such as specifications, tables, formulas, and other technical documents, can be used as needed.

CH4.4.6 Practical Examination

CH4.4.6.1 The practical examination shall consist of a demonstration of proficiency in performing tasks that are associated with the candidate's duties. Test samples used in the examination can be actual hardware or can be general test samples provided by the outside agency or the responsible Level III.

CH4.4.6.2 A checklist shall be developed by the outside agency or the responsible Level III administering the examinations to assist in the grading process.

CH4.4.6.3 Level I Practical

- a. The candidate shall demonstrate proficiency by following written instructions to process at least one sample for each technique in which certification is sought.
- b. At least two test samples shall be processed for each method.
- c. Test samples shall be representative of the products to be encountered by the candidate while performing their job duties with NASA.
- d. The checklist used for grading purposes shall address proficiency in the use and calibration of equipment and materials and adherence to procedural details.

CH4.4.6.4 Level II Practical

- a. The candidate shall demonstrate proficiency by inspecting at least one sample for each technique in which certification is sought.
- b. At least two test samples shall be inspected, evaluated, and the results interpreted and documented for each method.
- c. Test samples shall be representative of the products to be encountered by the candidate while performing their job duties with NASA.

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d. The checklist used for grading purposes shall address proficiency in the use and calibration of equipment and materials, adherence to procedural details, and the accuracy and completeness of interpretation and evaluation of indications, and, when applicable, the ability to develop written instructions.

CH4.4.6.5 Level III Practical

- a. For a Level III candidate not performing actual inspections or evaluations of hardware, the candidate shall demonstrate proficiency by preparing a written procedure for the operation of equipment used to perform an inspection including setup, calibration, and acquisition of data.
- b. If the duties of a Level III candidate include the operation of inspection equipment and/or evaluation of hardware, the candidate shall demonstrate proficiency in performing such tasks to the degree as defined for a Level II.
- c. The checklist used for grading purposes shall address the practical and technical adequacy of the procedures prepared by the candidate, and, when applicable, the adequacy of the interpretation and evaluation of indications.
- d. The results of the practical examination shall be documented.

CH4.4.7 Administration of Examinations

CH4.4.7.1 The administration and grading of all examinations shall be the responsibility of the outside agency or the responsible Level III.

CH4.4.7.2 Grading

- a. The candidates for certification shall achieve a minimum grade of 70 percent on the General and Specific examinations.
- b. The candidate shall detect all discontinuities and/or meet the conditions specified in this document during the Practical examination and achieve a minimum score of 70 percent.
- c. The candidate shall have a composite score of no less than 80 percent in order to be qualified for certification.
- d. All examination scores shall be of equal weight in determining the composite score.
- e. If a certificate of qualification is accepted as fulfilling part of this examination process and grading was issued as "pass/fail," the value for "pass" used for the composite score shall be 80 percent.

CH4.4.7.3 Re-Examination

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- a. Candidates who fail any General, Specific, or Practical examination shall receive additional training prior to re-examination of the failed exam.
- b. The re-examination shall not use the same written tests or test samples that were used in the initial examination.
- c. The re-examination shall contain a minimum of 25 percent new questions.

CH4.5 Evidence of Qualifications

CH4.5.1 Level I To be considered for certification, the Level I candidate shall have been qualified by the following:

CH4.5.1.1 Having a minimum classroom training of 16 hours for the PT and MT methods; a minimum classroom training of 40 hours for the ET, UT, and RT methods; a minimum classroom training of 32 hours for thermal/infrared testing methods; and a minimum classroom training of 8 hours for visual testing.

CH4.5.1.2 Having a minimum practical work experience of 130 hours for the PT and MT methods; a minimum practical work experience of 400 hours for the ET, UT, and RT methods; a minimum practical work experience of 210 hours for thermal/infrared testing methods; and a minimum practical work experience of 70 hours for visual testing.

CH4.5.1.3 Having passed the vision requirements listed in Table CH4-4.

CH4.5.1.4 Having passed the General, Specific, and Practical examinations with a score of no less than 70 percent on any exam, with a composite score of 80 percent for all three exams.

CH4.5.2 Level II To be considered for certification, the Level II candidate shall have been qualified by the following:

CH4.5.2.1 Having a minimum classroom training of 32 hours for the PT and MT methods; a minimum classroom training of 80 hours for the ET, UT, and RT methods; a minimum classroom training of 66 hours for thermal/infrared testing methods; and a minimum classroom training of 24 hours for visual testing.

CH4.5.2.2 Having a minimum practical work experience of 400 hours for the PT method; a minimum practical work experience of 530 hours for the MT method; a minimum practical work experience of 1600 hours for the ET, UT, and RT methods; a minimum practical work experience of 1470 hours for thermal/infrared testing methods; and a minimum practical work experience of 210 for visual testing.

CH4.5.2.3 Having passed the vision requirements listed in Table CH4-4.

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CH4.5.2.4 Having passed the General, Specific, and Practical examinations with a score of no less than 70 percent on any exam, with a composite score of 80 percent for all three exams.

CH4.5.3 Level III To be considered for certification, the Level III candidate shall have been qualified by one of the following:

CH4.5.3.1 High School Education:

- a. Having a minimum classroom training of 32 hours for the PT and MT methods; and a minimum classroom training of 80 hours for the ET, UT, and RT methods.
- b. Having a minimum of 4 years work experience as a Level II.
- c. Having passed the vision requirements listed in Table CH4-4.
- d. Having passed the General, Specific, and Practical examinations with a score of no less than 70 percent on any exam, with a composite score of 80 percent for all three exams.

CH4.5.3.2 2-Year Degree from a College:

- a. Having a minimum classroom training of 32 hours for the PT and MT methods; and a minimum classroom training of 80 hours for the ET, UT and RT methods.
- b. Having a minimum of 2 years work experience as a Level II.
- c. Having passed the vision requirements listed in Table CH4-4.
- d. Having passed the General, Specific, and Practical examinations with a score of no less than 70 percent on any exam, with a composite score of 80 percent for all three exams.

CH4.5.3.3 Graduate or at least 3 years from a College:

- a. Having a minimum classroom training of 32 hours for the PT and MT methods; and a minimum classroom training of 80 hours for the ET, UT, and RT methods.
- b. Having a minimum of 1 year work experience as a Level II.
- c. Having passed the vision requirements listed in Table CH4-4.
- d. Having passed the General, Specific, and Practical examinations with a score of no less than 70 percent on any exam, with a composite score of 80 percent for all three exams.

CH4.6 Certification

CH4.6.1 General

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CH4.6.1.1 Personnel who have demonstrated they possess the proper qualifications are eligible for NDE certification by NASA, in accordance with this written practice.

CH4.6.1.2 Certification is not required for individuals who are trainees or NDE witnesses.

CH4.6.2 Records

CH4.6.2.1 S&MA shall maintain certification records for personnel for as long as their certification is in effect.

CH4.6.2.2 Records shall be made available for review during audits.

CH4.6.2.3 The records shall include, as a minimum:

- a. Name of the individual certified.
- b. Level, method, and techniques for which the individual is certified.
- c. The latest written and practical exams and scores, and scores from previous exams the individual has taken.
- d. Date and expiration of current certification(s).
- e. A summary of all previous NDE certifications with NASA.
- f. Training history which identifies source, type of training, dates of training, and course hours.
- g. Work experience history with NASA to justify satisfaction of experience requirements in accordance with this written practice.
- h. Results of a current visual acuity and color perception examination.
- i. Extent and documentation of formal education, when used to meet qualification requirements.
- j. The name and signature of the S&MA Certifying Officer issuing the certification.

CH4.6.3 Loss of Certification. Certification can expire, be suspended, or be revoked. Certification shall expire when employment is terminated or when the certification interval has lapsed with no recertification issued.

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CH4.6.4 Suspension. Certification shall be suspended when the visual acuity examination is overdue, the individual does not perform in the method certified for 12 consecutive months, or when the individual's performance is found to be deficient in any manner.

CH4.6.5 Revocation. Certification shall be revoked when the individual does not perform in the method certified for at least 24 consecutive months or when the individual's conduct is found to be unethical or incompetent.

CH4.6.6 Reinstatement of Certification. Certifications that have been suspended shall be reinstated when the cause for suspension has been corrected and the correction verified by NASA, or the individual's proficiency is verified by a Level III.

CH4.6.6.1 Level I and Level II certifications that have expired or been revoked shall only be reinstated by recertification per paragraph CH4.6.7.

CH4.6.6.2 Level III certifications that have expired or been revoked shall only be reinstated by Specific and Practical re-examinations equivalent to initial certification.

CH4.6.7 Recertification For Levels I, II, and III. Levels I, II, and III personnel shall be re-certified at intervals not to exceed 5 years. Certification is considered to expire at the end of the corresponding month in which certification began.

CH4.6.7.1 Recertification of Levels I and II personnel shall be accomplished by Specific and Practical examinations equivalent to the initial certification.

CH4.6.7.2 Recertification of Level III personnel shall be accomplished by Specific and Practical examinations equivalent to the initial certification or by the credit system option specified below.

CH4.6.7.3 The Specific and Practical examinations shall be as described in section CH4.4.

CH4.6.8 Credit System For Recertification Of Level III NDE Personnel (Optional)

CH4.6.8.1 The credit system option specifies the requirements for recertification of Level III NDE personnel without examination. It applies only to personnel holding a valid Level III NDE certification at the time of recertification.

CH4.6.8.2 Application for recertification shall be made by Level III personnel at least 14 days, but no more than 4 months prior to the expiration date of the certification.

CH4.6.8.3 Application for recertification by Level III personnel shall be submitted to the employer or the applicable regulatory agency.

CH4.6.8.4 The candidate shall have been employed in a Level III function for a minimum of 36 months (at least 12 of which are in the last 24 months) within the previous 5 years in the method(s) for which recertification is sought. The number of months is cumulative and does not need to be consecutive months for validation purposes.

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CH4.6.8.5 Candidates shall provide objective evidence that they have kept up to date with current NDT technology in the method(s) for which they are seeking recertification by obtaining a minimum of 24 points during the 5-year period of certification, irrespective of the number of certifications (methods) obtained, by engaging in one or more of the activities listed in Table CH4-5.

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TABLE CH4-5: Level III Awarded Credit Activity

ACTIVITY	CRITERIA	Point Allocation	Maximum Points per 5 years
Authoring or co-authoring technical NDT papers, presentations, or white papers	Sole-Author	8	16
	Co-Author (contribution > 30 percent)	4	
	Co-Author (contribution < 30 percent)	2	
Authoring, co-authoring, or custodian for company or industry NDT specifications or standards	Each standard/specification	8	16
Attending technical sessions, seminars, committee or panel meetings organized by: a) National or international technical NDT societies, associations, and institutes b) Inter-company NDT teams comprised of members from several locations	1 day or 1 meeting	1	24
	2 days	2	
	3 or more days	4	
NDT technical training instructor teaching courses which are designed to prepare students for NDT qualification or academic qualifications	For each 8 hours of instruction	4	8
Participating in technical courses or seminars for which academic credit is given	For actual CEUs or academic credit earned	Actual CEUs/ credit awarded	16
Nondestructive testing examiner	For each examination session	1	8
NDT related technical and/or scientific publications published either internally or externally	For each published paper	4	8
Documented NDT contributions to company, technical society, or industry committee projects	For each documented contribution	4	8
Documented participation in NDT-related studies, developments, or investigations	For each documented contribution	4	8
Documented continuous satisfactory performance as a Level 3	Written testament by employer	4	16
Conduct external NDT audits	For each external audit conducted	1	16
Attend equipment or trade show	For each show attended	1	4

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CHAPTER 5

EPS

CH5.1 Purpose

This Chapter establishes the minimum requirements for the certification and/or qualification of MSFC personnel who fabricate or inspect flight or flight-associated hardware using EPS per the documents referenced herein.

CH5.1.1 Exceptions. Personnel developing technology and performing research shall not be required to be certified.

CH5.1.2 EPS Categories

CH5.1.2.1 Personnel performing EPS shall be certified as either operators or inspectors to the applicable MSFC document in Table CH5-1.

CH5.1.2.2 Operators shall be authorized to perform work on flight and flight-associated hardware.

CH5.1.2.3 Inspectors shall be authorized to accept flight and flight-associated hardware.

CH5.1.2.4 Personnel evaluating EPS for certification shall be classified as technical advisors.

- a. Technical advisors shall complete the same training requirements as operators and inspectors or have equivalent experience.
- b. Technical advisors do not need to be certified; however, they shall be recognized as experts in their field.
- c. Technical advisors shall be recommended by their supervisors for approval by the S&MA Certifying Officer.
- d. Beginning with technical advisors appointed after July 1999, supervisors shall submit to the S&MA Certifying Officer their documented credentials.

CH5.2 Training

CH5.2.1 Training Organization

CH5.2.1.1 Training shall be obtained from a school approved by a technical advisor and the S&MA Certifying Officer.

CH5.2.1.2 Other agencies used for training shall be subject to review and approval by the technical advisor and the S&MA Certifying Officer.

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CH5.2.2 Lesson Plans

CH5.2.2.1 Lesson plans shall be developed for each training course required.

CH5.2.2.2 The plans shall include topics to be addressed, practical test specifics, and examination examples.

CH5.2.2.3 Training contractor lesson plans shall be reviewed and approved by the technical advisor.

CH5.2.3 Instructor Qualifications

CH5.2.3.1 Instructors shall be recognized experts in their field.

CH5.2.3.2 Instructors shall be evaluated to requirements of the EPS documents specified herein, as determined by the S&MA Certifying Officer and technical advisor.

CH5.2.4 Training Requirements for Initial Certification

CH5.2.4.1 Personnel who perform operator or inspector tasks for any of the electrical processes shall meet the initial certification/qualification requirements of Table CH5-1.

CH5.2.4.2 Documented previous training and experience shall be accepted for certification at the discretion of the technical advisor and S&MA Certifying Officer.

CH5.2.4.3 Certification shall be required for all EPSs.

CH5.2.4.4 Also, operator certification for SMT (NASA-STD-8739.2) shall require additional training on the exact machine used for production at the supervisor's discretion.

CH5.3 Examinations

CH5.3.1 Written and practical examinations shall be administered and graded by the instructor or designated representative.

CH5.3.2 Copies of the examination shall be retained on file.

CH5.3.3 Vision Examination

CH5.3.3.1 Vision and color perception tests shall be administered per the applicable process document by the MSFC Medical Center personnel prior to certification.

CH5.3.3.2 Vision in at least one eye, natural or corrected, shall be required.

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CH5.3.3.3 The vision tests shall be administered prior to certification/recertification and shall be documented on MSFC Form 4293 "Eye Exam Certification" or an equivalent visual acuity record.

CH5.3.4 Written Examination

CH5.3.4.1 For initial certification, each candidate shall score at least 80 percent on a written exam typically consisting of at least 25 questions.

CH5.3.5 Practical Examination

CH5.3.5.1 The candidate shall pass a practical exam which is representative of the work to be performed and fully demonstrates proficiency in the skill (excluding ESD).

CH5.3.5.2 For inspectors, the practical exam shall include fabrication of samples and shall include an inspection test.

CH5.3.5.3 For operators, the practical exam can include an inspection test and shall include fabrication of samples.

CH5.3.5.4 As an option to the practical exam, proficiency demonstration can also be accomplished by a supervisor and S&MA Certifying Officer audit of actual work performed provided the audit results are documented and included in the employee's personnel certification file.

CH5.4 Certification

CH5.4.1 Candidate civil service personnel who meet the above criteria shall be certified by the S&MA Certifying Officer upon the recommendations of their supervisors.

CH5.4.2 Contractor personnel shall be certified by the individual designated by their company.

TABLE CH5-1. EPS TRAINING REQUIREMENTS (hours)			
TASK	INITIAL CERTIFICATION	RECERTIFICATION	REQUIREMENT
Soldering (thru-hole and SMT)	40	16	NASA-STD-8739.3/8739.2
Cabling	28	8	NASA-STD-8739.4
Crimping	12	4	NASA-STD-8739.4
Conformal coating/staking	16	8	NASA-8739.1
ESD control	2	(See CH5.4.3.4.)	MSFC-RQMT-2918

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CH5.4.3 Recertification

CH5.4.3.1 Training for recertification shall be required at the discretion of the individual's supervisor.

CH5.4.3.2 Recertification shall include a demonstration of proficiency in accordance with CH5.3.4.

CH5.4.3.3 Recertification of EPS operators and inspectors shall be required every 2 years except for ESD.

CH5.4.3.4 ESD recertification shall be required at the discretion of the individual's supervisor based on personnel performance, the use of new technology, or when requirement violations are observed.

CH5.4.3.5 When necessary, the S&MA Certifying Officer shall extend or limit the certification period based on recommendations of the individual's supervisor. Extensions shall not exceed 6 months.

CH5.4.3.6 EPS proficiency examiners/instructors shall be recertified every 2 years except for ESD.

CH5.4.4 Demonstration of proficiency shall be required for recertification. This can be achieved by fabrication/inspection of samples, completion of a refresher training course approved by the technical advisor, or by an audit of an individual's actual work performed by the S&MA Certifying Officer and their supervisor. Recertification can also include a written examination.

CH5.4.5 Each recertification method shall require documentation to substantiate compliance. The method chosen for recertification shall be the responsibility of the individual's supervisor.

CH5.4.6 Loss of Certification. Certification shall be revoked under the following conditions:

CH5.4.6.1 Evidence of deficient performance.

CH5.4.6.2 Interruption of a work period for more than 6 months.

CH5.4.6.3 New techniques have been developed which require different skills.

CH5.4.6.4 Employment has been terminated.

CH5.4.6.5 Job function has changed and new function does not require EPS.

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CHAPTER 6

MAF SAFETY CERTIFICATION REQUIREMENTS

CH6.1 Safety Certification Requirements are identified in Table CH6-1 below.

TABLE CH6-1 MAF SAFETY CERTIFICATION REQUIREMENTS			
CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTI- FICATION PERIOD	RECERTIFICATION REQUIREMENTS
Aerial Lift Operator • Hy-Reach Lift • Elevated Work Platforms - AMV/RAL • Aerial Work Platform - Simon & Krause • Aerial Work Platform – Articulating Boom • Aerial Work Platform – 111 foot • Self Propelled Lift • Electrical Bucket Truck • Manually Positioned Lift [29 CFR Part 1910.67; 29 CFR Part 1926.453 and NASA-STD-8719.9] (See CH6.1.4.)	• Aerial Platform Training (SMA-SAFE-NSTC-0030), Manufacturer's Course or (SHE 509) • Fall Protection (SMA-SAFE-NSTC-0311) or (SHE 113) • Type B OJT • Written and Proficiency Tests • Medical exam – Category I • Specific training as determined by the MSFC S&MA representative located at MSFC's MAF or designee for each specific type equipment	4 Years	• Refresher Training (SMA-SAFE-NSTC-0030) or SHE 509) • Proficiency Test • Medical exam – Category I
Atmospheric Sampling (See CH6.1.4.)	• Specific training as determined by the MSFC S&MA representative located at MSFC's MAF or designee	4 Years	• Specific training as determined by the MSFC S&MA representative located at MSFC's MAF or designee
Bloodborne Pathogens Operations (Janitorial) (See CH6.1.4.)	• SHE 204 Bloodborne Pathogens Exposure Control	4 Years	• SHE 204 Bloodborne Pathogens Exposure Control
Confined Space Entry [29 CFR Part 1910.146 and MPR 1840.1]	• Confined Space Entry Training (SHE 209A) • Written Test • Medical exam – Category IV	1 Year	• Refresher Training (SHE 209B) • Medical exam – Category IV
Cryogen System Operator (See CH6.1.4.)	• Cryogenic Safety (SMA-SAFE-NSTC 0313) or (SHE 124) • HazCom (SHE 214) • Type A OJT (40 Hours) • Medical exam – Category III	4 Years	• Refresher Training (SMA-SAFE-NSTC 0313) or (SHE 124) • Medical exam – Category III
Foreign Object Damage (FOD) [40 CFR 82 Subpart B] (See CH6.1.4.)	• Specific training as determined by the Center Operations representative located at MSFC's MAF	2 Years	• Specific training as determined by the Center Operations representative located at MSFC's MAF

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TABLE CH6-1 MAF SAFETY CERTIFICATION REQUIREMENTS

CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTI- FICATION PERIOD	RE-CERTIFICATION REQUIREMENTS
Forklift Operator: <ul style="list-style-type: none"> • Light Fork Truck – Max 10K lbs. • Heavy Fork Truck –Over 10K lbs • Side Load Fork Truck • Hand Operator Fork Truck • Order Picker • Light Tow Truck • Heavy Tow Truck <p>[NASA STD 8719.9 and MWI 6430.1]</p> <p>(See CH6.1.4.)</p>	<ul style="list-style-type: none"> • Forklift Safety (SMA-SAFE-NSTC 0210) or (SHE 505) • Shall be 18 years old to operate • PCH Training for PCH Certification. (SHE 500) If required to move PCH • Written and Proficiency Tests • Type A OJT for PCH/Critical • Type B OJT otherwise • Medical exam – Category I • Specific training as determined by the MSFC S&MA representative located at MSFC's MAF or designee for each specific type equipment 	3 Years	<ul style="list-style-type: none"> • Refresher Training (SMA-SAFE-NSTC 0210) or (SHE 506) • Shall be 18 years old • Medical exam – Category I • Proficiency Test • Current certification as a Forklift Operator
Hazardous Waste Operations and Emergency Response (HAZWOPER) Technician <ul style="list-style-type: none"> • Hazardous Waste Operations & Emergency Response <p>[NPR 8715.3]</p> <p>(See CH6.1.4.)</p>	<ul style="list-style-type: none"> • HAZWOPER (40 Hours) (SHE 303) • Medical exam - Category III 	1 Year	<ul style="list-style-type: none"> • HAZWOPER Management Refresher • SHE 308 Hazardous Waste Operations & Emergency Response Technician (8 Hr) • Medical Exam - Category III
Hazardous Waste Operations <ul style="list-style-type: none"> • Hazardous Waste Documentation – HMAC • Hazardous Operations Building 159 • Hazardous Waste Processor • Spill Prevention, Control & Counter measures (SPCC) • Facility Response Plan • Industrial Wastewater Treatment <p>[NPR 8715.3]</p> <p>(See CH6.1.4.)</p>	<ul style="list-style-type: none"> • Specific training as determined by the Center Operations representative located at MSFC's MAF for each type operation • SHE 307 HAZMAT Transportation • SHE 310C Storm Water Training • Medical exam - Category III 	As determined by the Center Operations representative located at MSFC's MAF for each type operation	<ul style="list-style-type: none"> • Specific training as determined by the Center Operations representative located at MSFC's MAF for each type operation • Medical exam - Category III
HAZWOPER Incident Commander [NPR 8715.3]	<ul style="list-style-type: none"> • HAZWOPER with an Incident Command Element Training (40 Hours) (SHE 314) • Medical exam – Category III 	1 Year	<ul style="list-style-type: none"> • HAZWOPER with an Incident Command Element Training Refresher (8 Hours) (SHE 315) • Medical exam – Category III
High Pressure System Operator (> 150 psig) (liquid/vapor/gas) [NPR 8715.3] (See CH6.1.1.)	<ul style="list-style-type: none"> • Safety in High Pressure Operations (SMA-SAFE-NSTC-0315) • Medical exam – Category III 	4 Years	<ul style="list-style-type: none"> • Refresher training (SMA-SAFE-NSTC-0315) • Medical exam – Category III

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TABLE CH6-1 MAF SAFETY CERTIFICATION REQUIREMENTS

CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTI- FICATION PERIOD	RECERTIFICATION REQUIREMENTS
High Voltage Electrician Safety [NPR 8715.3]	<ul style="list-style-type: none"> Power Transmission and Distribution (SMA-SAFE-NSTC-0075) or equivalent High Voltage safety course Medical exam – Category III CPR 	4 Years	<ul style="list-style-type: none"> Refresher Course (Electrical Safety Refresher SMA-SAFE-NSTC-0310 or equivalent) Medical exam – Category III
Hydrogen System Operator (See CH6.1.5.)	<ul style="list-style-type: none"> Safety in Hydrogen System Operations (SMA-SAFE-NSTC-0054) HazCom (SHE 214) Medical exam – Category III Type A OJT (40 hours) 	4 Years	<ul style="list-style-type: none"> Refresher Training (SMA-SAFE-NSTC-0054) Medical exam – Category III
Laser Maintenance Personnel [MPD 1860.1, ANSI Z136.1 and NPR 8715.3]	<ul style="list-style-type: none"> Laser Safety Course (SHE 216) Lockout/Tagout (SMA-SAFE-NSTC-0814) or (SHE 128) Medical exam – Category V 	1 Year	<ul style="list-style-type: none"> Refresher Training (SHE 216) Medical exam – Category V
Laser Operator (> Class 3b or 4) [MPD 1860.1, ANSI Z136.1 and NPR 8715.3]	<ul style="list-style-type: none"> Laser Safety Course (SHE 216) Medical exam – Category V Initial and Exit Ophthalmology Exam 	1 Year	<ul style="list-style-type: none"> Refresher Training (SHE 216) Medical exam – Category V
Liquid Nitrogen System Operator [NPR 8715.3] (See CH6.1.5.)	<ul style="list-style-type: none"> Liquid Nitrogen Handlers Course Employees working with less than 250 gallon dewars (SMA-SAFE-NSTC-0314) or (SHE 123) Cryogenic Safety Employees working with more than 250 gallon dewars (SMA-SAFE-NSTC-0313) or equivalent (SHE 124) HazCom (SHE 214) Medical exam – Category III Type A OJT (40 hours) 	4 Years	<ul style="list-style-type: none"> Refresher training (SMA-SAFE-NSTC-0314) or (SHE 123) Medical exam – Category III
Lockout/Tagout, Authorized Employee [MWI 8715.2 and 29 CFR Part 1910.147]	<ul style="list-style-type: none"> Lockout/Tagout (SMA-SAFE-NSTC-0814) or (SHE 128) Written Test 	4 Years	<ul style="list-style-type: none"> Refresher Training (SHE 128) Written Test

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TABLE CH6-1 MAF SAFETY CERTIFICATION REQUIREMENTS

CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTI- FICATION PERIOD	RECERTIFICATION REQUIREMENTS
Mobile Crane Operator – including <ul style="list-style-type: none"> • P&H 15 & 22 Ton • Grove 15 Ton • Grove 45 Ton • Grove 50 Ton • Grove 90 Ton • 2 Ton Mobile Crane [NASA STD 8719.9 and MWI 6430.1] (See CH6.1.4.)	<ul style="list-style-type: none"> • Mobile Crane Safety (SMA-SAFE-NSTC-0208) or (SHE 516 for Mobile Crane or SHE 518 for Derrick Crane) • PCH Training for PCH Certification (SHE 500) if required to move PCH • Type A OJT for PCH/Critical • Type B OJT otherwise • Written and Proficiency Tests • Medical exam – Category I • Mobile Crane only – CDL required for travel on roadway • Specific training as determined by the MSFC S&MA representative located at MSFC's MAF or designee for each specific type equipment 	4 Years	<ul style="list-style-type: none"> • Refresher Training (SHE 516 or SHE 518) • Medical exam – Category I • Proficiency test • Valid CDL and DOT medical card
Overhead Crane/Hoist Operator – <ul style="list-style-type: none"> • VAB Crane (17.5, 20 & 75 Ton) • Radio Controlled Crane • VAB Jib Boom Crane [NASA STD 8719.9 and MWI 6430.1]	<ul style="list-style-type: none"> • Overhead Cranes and Materials Handling (SMA-SAFE-NSTC-0205) or (SHE 507 for overhead/hoist and Portal Crane) • PCH Training for PCH Certification (SHE 500) If required to move PCH • Type A OJT for PCH/Critical • Type B OJT otherwise • Written and Proficiency Tests • Medical exam – Category I • Specific training as determined by the MSFC S&MA representative located at MSFC's MAF or designee for each specific type equipment 	4 Years	<ul style="list-style-type: none"> • Refresher Training (SMA-SAFE-NSTC-0028) or (SHE 508) • Medical exam – Category I • Proficiency Test
Oxygen System Operator (See CH6.1.4 and CH6.1.5.)	<ul style="list-style-type: none"> • Oxygen Systems: Operation and Maintenance (SMA-SAFE-NSTC-0053) or (SHE 131) • HazCom (SHE 214) • Medical exam – Category III • Type A OJT (40 Hours) 	4 Years	<ul style="list-style-type: none"> • Refresher training (SMA-SAFE-NSTC-0053) or (SHE 131) • HazCom Refresher (SHE 214) • Medical exam – Category III
PCH Handler – <ul style="list-style-type: none"> • Prime Mover Employees involved in the actual hands-on PCH move such as hand carry (manual move) and operating lifting and moving equipment. Employees that are not directly involved the in hands-on operation only need monitor training (SHE 504). [MWI 6410.1]	<ul style="list-style-type: none"> • PCH Training, (SHE 500) • Medical exam – Category I • Specific training as determined by the MSFC S&MA representative located at MSFC's MAF or designee for each specific type equipment 	3 Years	<ul style="list-style-type: none"> • Refresher Training (SHE 500) • Medical exam – Category I
Power Actuated Fastening Tool Operation HILTI (See CH6.1.4.)	<ul style="list-style-type: none"> • SHE 135 Powder-Actuated Tool Operator 	4 Years	<ul style="list-style-type: none"> • SHE 136 Powder-Actuated Tool Operator Refresher

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TABLE CH6-1 MAF SAFETY CERTIFICATION REQUIREMENTS

CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTI- FICATION PERIOD	RECERTIFICATION REQUIREMENTS
Propellant and Explosive Handler/User [NSS 1740.12 and MWI 8715.10]	<ul style="list-style-type: none"> Basic Explosive Safety (SMA-SAFE-NSTC-0082) or (SHE 111) Type A OJT (40 Hours) Medical exam – Category III 	3 Years	<ul style="list-style-type: none"> Refresher training (Refresher Course for Explosive Handlers and Operational Personnel, (SMA-SAFE-NSTC-0009) or (SHE 111) Medical exam – Category III
Propellant and Explosive Inspector	<ul style="list-style-type: none"> Basic Explosive Safety (SMA-SAFE-NSTC-0082) or (SHE 111) Proficiency with QD-QA-019 Type A OJT (80 Hours) Medical exam – Category III 	3 Years	<ul style="list-style-type: none"> Refresher training (Refresher Course for Explosive Handlers and Operational Personnel, (SMA-SAFE-NSTC-0009) or (SHE 111) Medical exam – Category III
Radiation – Personnel designated to wear dosimeters or designated as “authorized user” [MPR 1860.1 and MPD 1860.2]	<ul style="list-style-type: none"> Radiation – Ionizing Radiation Producing Devices (SHE 228) 	1 Year	<ul style="list-style-type: none"> Refresher training (SHE 228)
Respirators (Non-SCBA) – <ul style="list-style-type: none"> Respirator Use Respirator Use, On Sheet Dust Respirator Use [MPD 1840.3]	<ul style="list-style-type: none"> Respirator Training (SHE 212) Medical exam – Category IV Specific training as determined by the MSFC S&MA representative located at MSFC’s MAF or designee for each specific type equipment 	1 Year	<ul style="list-style-type: none"> Refresher training (SHE 212) Medical exam – Category IV
Rigger [NASA STD 8719.9] (See CH6.1.4.)	<ul style="list-style-type: none"> Lift Riggers Course (Contact ISB) Written and Proficiency Tests Type A OJT for PCH/Critical Type B OJT otherwise Medical exam – Category I PCH Training for PCH Certification (SHE 500) 	4 Years	<ul style="list-style-type: none"> Refresher Course (Contact ISB) Medical exam – Category I Proficiency Test
Self-Contained Breathing Apparatus (SCBA) <ul style="list-style-type: none"> Drager (SCBA) [MPD 1840.3]	<ul style="list-style-type: none"> SCBA Training (SHE 212) Medical exam – Category IV Specific training as determined by MSFC S&MA representative located at MSFC’s MAF or designee for each specific type equipment 	1 Year	<ul style="list-style-type: none"> Refresher training (SHE 212) Medical exam – Category IV
Thermal Protection System (TPS) (See CH6.1.4.)	<ul style="list-style-type: none"> Specific training as determined by the MSFC S&MA representative located at MSFC’s MAF or designee 	2 Years	<ul style="list-style-type: none"> Specific training as determined by the MSFC S&MA representative located at MSFC’s MAF or designee
Tooling Torque Wrench (See CH6.1.4.)	<ul style="list-style-type: none"> Specific training as determined by the MSFC S&MA representative located at MSFC’s MAF or designee 	4 Years	<ul style="list-style-type: none"> Specific training as determined by MSFC S&MA representative located at MSFC’s MAF or designee

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TABLE CH6-1 MAF SAFETY CERTIFICATION REQUIREMENTS			
CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTI- FICATION PERIOD	RE-CERTIFICATION REQUIREMENTS
Welding Safety [NPR 8715.3] (See CH6.1.4.)	<ul style="list-style-type: none"> Welding and Cutting (SMA-SAFE-NSTC-0064) or equivalent (SHE 137) Medical exam – Category III 	4 Years	<ul style="list-style-type: none"> Refresher training (SMA-SAFE-NSTC-0064 or equivalent) (SHE 137) Medical exam – Category III

CH6.1.1 Employees working with compressed gas cylinders or compressed gas trailers are not required to have High Pressure Systems Operators certification. These employees are required to take the appropriate safety awareness training, Compressed Gas Cylinder Safety (SMA-SAFE-NSTC-0319) or Compressed Gas Trailer Safety (SMA-SAFE-NSTC-0318).

CH6.1.2 Employees who fail medical exams, for a qualification specialty, are given a provisional 3-months time period, whereby their qualification is moved to the inactive file. During the 3-months time period, a screening process is performed by the MAF Medical Center to determine if the medical condition has been corrected. If the condition has been corrected, the qualification shall be moved to the active status. If the condition has not been corrected, the qualification shall remain in the inactive status. This process is tracked in CERTRAK.

CH6.1.3 Contractors shall obtain the MSFC's MAF certification appropriate for the activities being performed, that require the MSFC qualification listed in Chapter 6, and have the qualified employee listed in CERTRAK. If a contractor believes they are currently excluded from this requirement, they are to contact their MSFC CO to obtain documentation of exclusion from this requirement in their current contract. All future and renewed contracts shall include these qualification requirements. Contact the MSFC S&MA representative located at MSFC's MAF or designee if more information is needed.

CH6.1.4 SHE equivalent courses are still in development. Equivalent courses developed by contractors shall be approved by the MSFC SHE Training Subcommittee exclusively for use by that contractor. Contact the MSFC S&MA representative located at MSFC's MAF or designee if more information is needed.

CH6.1.5 High Pressure System Operators, Hydrogen System Operators, and Oxygen System Operators can elect to attend the extended training courses, Safety in High Pressure Systems, Hydrogen Safety, and Fire Hazards in Oxygen Systems (as applicable).

CH6.1.6 Certifications can expire, be suspended, or be revoked. Certification shall expire when employment is terminated or when the certification interval has lapsed with no recertification issued.

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CHAPTER 7

TRAINING NOT PROVIDED BY MSFC's MAF

CH7.1 State, Federal, and Other provided training requirements are identified in Table CH7-1 below.

TABLE CH7-1 STATE, FEDERAL, AND OTHER TRAINING REQUIREMENTS			
CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERTIFI- CATION PERIOD	RECERTIFICATION REQUIREMENTS
Asbestos Abatement for asbestos/heavy metal: <ul style="list-style-type: none"> • Supervisor • Worker [Alabama Asbestos Contractor Accreditation Act (89-517) or State of Louisiana equivalent; 40 CFR Part 1910.1001 and 1926.1101]	<ul style="list-style-type: none"> • State Accredited Training [State Registration, Safe State (1-800-452-5928)] • Supervisor State-Accredited Course • Worker State-Accredited Course • Medical exam 	1 Year	<ul style="list-style-type: none"> • State-Accredited Refresher Course • Medical exam
Asbestos Operations and Maintenance (Class III) [40 CFR Part and 1910.1001 and 1926.1101]	<ul style="list-style-type: none"> • State Accredited Training [State Registration, Safe State (1-800-452-5928)] 	1 Year	<ul style="list-style-type: none"> • State-Accredited Refresher Course
Asbestos Operations <ul style="list-style-type: none"> • On Sheet Activities • Asbestos Glove Bag Tech • Asbestos Full Enclosure • Asbestos Respirator use • Asbestos Contractor/Supervisor • Asbestos Designer [40 CFR Part and 1910.1001 and 1926.1101]	<ul style="list-style-type: none"> • Specific training as determined by the MSFC S&MA representative located at MSFC's MAF or designee for specific type operation • SHE 200 Asbestos Exposure Awareness (Class IV Asbestos Work) • SJE 201 Asbestos Operations and Maintenance (Class III Asbestos Work) • SHE 205 Asbestos Operations and Maintenance (Class III Asbestos Work) • SHE 233 Asbestos Operations and Maintenance (Class II work) • SHE 234 Asbestos Supervisor Initial Training • SHE 235 Asbestos Operations and Maintenance (Class II work) 	As specified by the MSFC S&MA representative located at MSFC's MAF or designee	<ul style="list-style-type: none"> • SHE 236 Asbestos Supervisor Refresher
Commercial Motor Vehicle Operator <ul style="list-style-type: none"> • Class A >26,001 lbs • Class B <26,000 lbs • Class C • Hazardous Material endorsement • Tanker endorsement • Hazardous Material/Tanker endorsement Air Brakes restriction	<ul style="list-style-type: none"> • Valid Department of Transportation (DOT) Medical Card (requires Medical examination; valid for 2 years) – Category Ia • Valid state-issued Commercial Driver License (CDL) 	4 Years	<ul style="list-style-type: none"> • Copy of renewed state-issued CDL • Copy of renewed DOT Medical Card
Flight Deck Crew	<ul style="list-style-type: none"> • Appropriate FAA license and certification • Medical exam 	Determined by FAA	<ul style="list-style-type: none"> • FAA requirements • Medical exam

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Heavy Equipment Operator (earth-moving equipment) [NPR 8715.3] Mobile Sweeper Operator (See CH7.1.2 and CH7.1.3.)	<ul style="list-style-type: none"> Valid state-issued CDL, Class A or B Valid DOT Medical Card Medical exam Type B OJT 	4 Years	<ul style="list-style-type: none"> Valid state-issued CDL Valid DOT Medical Card Medical exam
Hydraset Operator [NASA 8719.9] (See CH7.1.2 and CH7.1.3.)	<ul style="list-style-type: none"> Manufacturer's Course or equivalent PCH Training for PCH Certification (SHE 500) Type A OJT for PCH/Critical Type B OJT otherwise Written and Proficiency Tests Medical exam 	4 Years	<ul style="list-style-type: none"> Refresher Training Proficiency Test Medical exam
Lifting Equipment Examiner (Proficiency Test Examiner for the following:) Forklift Mobile Crane Overhead Cranes/Aerial Lifts Rigging KAMAG™, Portal Crane, Derrick Crane Hydraset	<ul style="list-style-type: none"> Associated Train-the-Trainer Certified Course or equivalent when approved by MSFC ISB Medical exam Supervisor Statement verifying experience/OJT submitted to S&MA for review/approval 	3 Years	<ul style="list-style-type: none"> Associated Train-the-Trainer Recertification Course, or equivalent when approved by MSFC ISB Medical exam
Welding <ul style="list-style-type: none"> Manual Gas Tungsten Arc (GTA) Welding, 6061 GTA Welding, Stainless Steel Shielded Metal Arc (SMA) Carbon Steel Welding SMA Stainless Steel Welding Gas Metal Arc Welding (GMAW) Carbon Steel Plate GMAW Carbon Steel Pipe Stainless Steel Gas Tungsten Arc Welding Carbon Steel Gas Tungsten Arc Carbon Steel to Stainless Steel, Gas Tungsten Carbon Steel Gas Tungsten/Gas Metal Arc Welding [NPR 8715.3] (See CH7.1.4.)	<ul style="list-style-type: none"> Welding and Cutting (SMA-SAFE-NSTC-0064) or equivalent (SHE 137) Medical exam For GTA and GMAW – AMS 1595A For others ASME IX Specific training as determined by the MSFC S&MA representative located at MSFC's MAF, designee, or NASA Program or Project representative for each type operation 	As required by AMS 1995A and ASME IX or as specified by the NASA Program or Project	<ul style="list-style-type: none"> Welding and Cutting (SMA-SAFE-NSTC-0064) or equivalent (SHE 137) For GTA and GMAW – AMS 1595A For others ASME IX Medical exam

CH7.1.1 Training specialties in Table CH7-1 do not require MSFC Forms 4083, "Personnel Certification" or 4083-2, "Annual Personnel Certification Statement."

CH7.1.2 Contractor Safety Representatives shall ensure employees are compliant with State, Federal, and other regulations (as applicable). If a contractor believes they are currently excluded from this requirement, they are to contact their MSFC CO to obtain documentation of exclusion from this requirement in their current contract. All future and renewed contracts shall include these certification requirements. Contact the MSFC S&MA representative located at MSFC's MAF or designee if more information is needed.

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CH7.1.3 SHE-equivalent courses are still in development. Equivalent courses developed by contractors shall be approved by the MSFC SHE Training Subcommittee exclusively for use by that contractor. Contact the MSFC S&MA representative located at MSFC's MAF or designee if more information is needed.

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